BETHLEHEM SECTIONS

DIMENSIONS AND PROPERTIES

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

BETHLEHEM SECTIONS

DIMENSIONS
PROPERTIES
ECONOMY TABLE

Catalogue S 40-A

BETHLEHEM STEEL EXPORT
CORPORATION
437 ST. JAMES STREET
MONTREAL

BETHLEHEM STEEL COMPANY
GENERAL OFFICES: BETHLEHEM, PA.

Copyright, 1931
Bethlehem Steel Company

INTRODUCTION

This catalogue is a condensed edition of another publication entitled "BETHLEHEM SECTIONS"—Catalogue S–40.

Dimensions and properties of all Bethlehem Sections are presented herein. Bethlehem Girder Beams, I Beams, H Columns, Joists and Stanchions in the following tables are combined and classified in order of depth.

On pages 26 and 27 properties and other data for H Columns reinforced with cover plates are tabulated.

Following the dimensions and properties of reinforced H Columns is presented a table showing economy with respect to section modulus for Bethlehem Sections used as beams.

Finally, on pages 34 to 37 are tables of unit stresses to be used in designing centrally loaded columns for various usual ratios of length to least radius of gyration, these being based on the A.I.S.C. formula.

The slope of the flanges of all Bethlehem Girder Beams and I Beams is 8⅓ per cent and the slope of the flanges of all Bethlehem Joists and Stanchions is 2 per cent. Bethlehem H Columns have no slopes on the inside of flanges.

These series of wide flange sections are protected by United States Letters Patent.

In computing the weights and properties of all Bethlehem Sections the fillets have been included. Weights of rolled sections are calculated on the basis of 489.6 pounds per cubic foot; and 3.4 times the sectional area, in square inches, equals the weight in pounds per linear foot.

The dimensions and weights of Bethlehem Sections published herein are theoretical and subject to the usual variations.

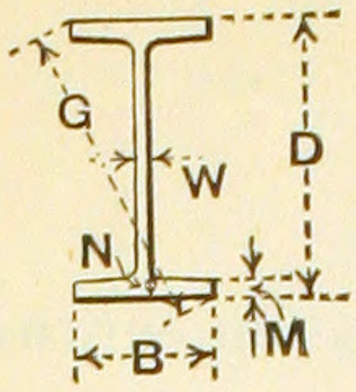
All sections are numbered for convenience in identification and ordering.

Complete information regarding Standard I beams, structural and ship channels, angles, bulb angles, T-bars, Z-bars, etc., is given in another publication entitled "STANDARD STRUCTURAL SHAPES, SHIPBUILDING AND CAR BUILDING SHAPES."

BETHLEHEM STEEL COMPANY

Bethlehem, Pennsylvania
June, 1931

ID 93-B1569 CORM



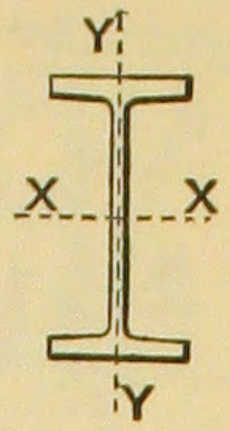
PROPERTIES OF

BETHLEHEM SECTIONS

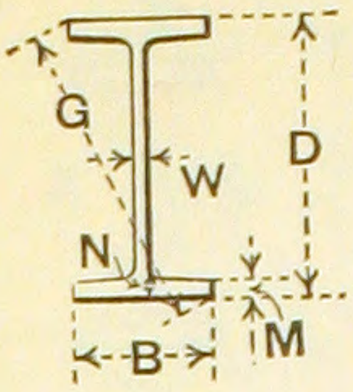
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES Web W	Flange M	Flange N	Diagonal Distance, Inches G	AXIS X-X Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
	300	36.72	16.655	.945	1.353	2.007	40 5/16	20,262	15.16	1103.6	.080
	280	36.50	16.600	.890	1.243	1.897	40 1/8	18,811	15.10	1030.8	.080
G36	260	36.24	16.555	.845	1.113	1.767	39 13/16	17,205	15.00	949.5	.081
36×16½	250	36.12	16.530	.820	1.053	1.707	39 3/4	16,457	14.95	911.2	.081
	240	36.00	16.500	.790	.993	1.647	39 5/8	15,696	14.92	872.0	.081
	230	35.88	16.475	.765	.933	1.587	39 1/2	14,960	14.87	833.9	.081
	192	36.50	12.110	.745	1.033	1.507	38 7/16	12,082	14.63	662.0	.085
	176	36.25	12.065	.700	.908	1.382	38 3/16	10,902	14.51	601.5	.086
B36	167	36.12	12.035	.670	.843	1.317	38 1/16	10,271	14.46	568.7	.086
36×12	158	36.00	12.000	.635	.783	1.257	37 15/16	9665.2	14.43	537.0	.086
	150	35.88	11.975	.610	.723	1.197	37 13/16	9104.0	14.37	507.5	.087
	260	33.75	15.920	.890	1.212	1.838	37 5/16	14,872	13.95	881.3	.087
	240	33.50	15.865	.835	1.087	1.713	37 1/16	13,575	13.86	810.5	.087
G33	220	33.25	15.810	.780	.962	1.588	36 13/16	12,302	13.78	740.0	.088
33×15¾	210	33.12	15.780	.750	.897	1.523	36 11/16	11,645	13.73	703.2	.088
	200	33.00	15.750	.720	.837	1.463	36 9/16	11,038	13.69	669.0	.088
	152	33.50	11.565	.635	.827	1.283	35 7/16	8136.2	13.49	485.7	.092
B33	141	33.31	11.535	.605	.732	1.188	35 1/4	7430.8	13.38	446.2	.093
33×11½	132	33.15	11.510	.580	.652	1.108	35 1/16	6845.4	13.28	413.0	.094
	125	33.00	11.500	.570	.577	1.033	34 15/16	6343.3	13.14	384.4	.096

PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
1177.7	3.66	141.4	.623	88.12	13,240,000	1,655,000	416,400	15.9	300
1081.4	3.62	130.3	.633	82.45	12,370,000	1,546,000	389,800	15.9	280
973.7	3.57	117.6	.650	76.50	11,390,000	1,424,000	367,500	15.5	260
923.8	3.54	111.8	.659	73.61	10,930,000	1,367,000	355,400	15.4	250
873.5	3.52	105.9	.666	70.55	10,460,000	1,308,000	341,300	15.3	240
824.5	3.49	100.1	.676	67.67	10,010,000	1,251,000	329,400	15.2	230
344.4	2.47	56.9	.992	56.46	7,944,000	993,000	326,300	12.2	192
303.7	2.42	50.3	1.029	51.80	7,218,000	902,200	304,500	11.9	176
282.3	2.40	46.9	1.047	49.15	6,824,000	853,100	290,400	11.7	167
262.4	2.38	43.7	1.062	46.44	6,443,000	805,400	264,400	12.2	158
243.4	2.35	40.7	1.085	44.10	6,090,000	761,200	245,800	12.4	150
928.5	3.48	116.6	.655	76.45	10,580,000	1,322,000	360,500	14.7	260
835.0	3.44	105.3	.671	70.63	9,725,000	1,216,000	335,700	14.5	240
743.4	3.39	94.0	.689	64.83	8,880,000	1,110,000	311,200	14.3	220
696.2	3.36	88.2	.700	61.78	8,439,000	1,055,000	298,100	14.2	210
652.9	3.33	82.9	.710	58.90	8,028,000	1,003,000	285,100	14.1	200
245.1	2.34	42.4	1.054	44.68	5,829,000	728,600	255,300	11.4	152
218.7	2.30	37.9	1.094	41.48	5,354,000	669,200	238,200	11.2	141
196.8	2.25	34.2	1.135	38.81	4,956,000	619,500	220,600	11.2	132
177.2	2.20	30.8	1.192	36.75	4,613,000	576,700	213,100	10.8	125



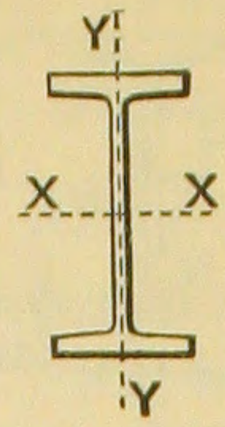
PROPERTIES OF

BETHLEHEM SECTIONS

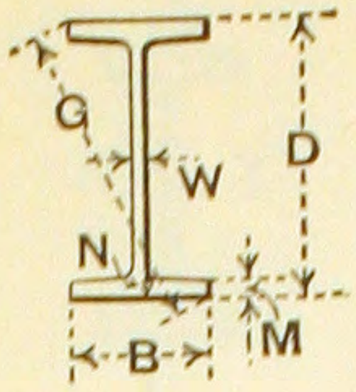
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES: Web W	Flange M	Flange N	Diagonal Distance, Inches G	AXIS X-X: Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
G30 30×15	240	30.75	15.205	.880	1.202	1.798	34 5/16	11,412	12.72	742.3	.095
	220	30.50	15.140	.815	1.077	1.673	34 1/16	10,367	12.65	679.8	.095
	200	30.25	15.070	.745	.952	1.548	33 13/16	9332.7	12.59	617.0	.095
	190	30.12	15.035	.710	.887	1.483	33 11/16	8806.7	12.56	584.8	.095
	180	30.00	15.000	.675	.827	1.423	33 9/16	8320.4	12.53	554.7	.096
B30 30×10½	131	30.31	10.545	.600	.798	1.212	32 1/16	5738.5	12.21	378.7	.102
	122	30.12	10.525	.580	.703	1.117	31 7/8	5235.7	12.08	347.7	.103
	115	30.00	10.500	.555	.643	1.057	31 13/16	4894.1	12.02	326.3	.104
	108	29.88	10.475	.530	.583	.997	31 11/16	4556.2	11.96	305.0	.104
G28 28×14¼	175	28.12	14.285	.710	.860	1.426	31 9/16	7026.0	11.69	499.7	.103
	166	28.00	14.250	.675	.800	1.366	31 7/16	6624.6	11.66	473.2	.103
	156	27.88	14.210	.635	.740	1.306	31 5/16	6218.6	11.64	446.1	.103
	145	27.75	14.160	.585	.675	1.241	31 1/8	5772.3	11.63	416.0	.103
B28 28×10	112	28.25	10.065	.535	.724	1.121	30	4328.0	11.46	306.4	.108
	104	28.12	10.030	.500	.659	1.056	29 7/8	4003.3	11.43	284.7	.108
	97	28.00	10.000	.470	.599	.996	29 3/4	3711.5	11.39	265.1	.108
	91	27.88	9.980	.450	.539	.936	29 5/8	3441.1	11.32	246.9	.109
	85	27.69	9.980	.450	.444	.841	29 7/16	3075.2	11.10	222.1	.112
G26 26×14	171	26.38	14.090	.685	.908	1.467	29 15/16	6148.0	11.06	466.1	.108
	157	26.19	14.035	.630	.813	1.372	29 11/16	5603.2	11.01	427.9	.108
	145	26.00	14.000	.595	.718	1.277	29 1/2	5098.0	10.94	392.2	.109
B26 26×9½	101	26.31	9.565	.515	.691	1.069	28	3385.7	10.68	257.4	.115
	91	26.12	9.525	.475	.596	.974	27 13/16	3014.1	10.60	230.8	.116
	85	26.00	9.500	.450	.536	.914	27 11/16	2783.4	10.54	214.1	.117

PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches⁴ I′	Radius of Gyration, Inches r′	Section Modulus, Inches³ S′	Bending Factor k′						
798.5	3.36	105.0	.672	70.54	8,907,000	1,113,000	324,700	13.7	240
715.3	3.32	94.5	.685	64.76	8,158,000	1,020,000	298,300	13.7	220
633.4	3.28	84.1	.700	58.86	7,404,000	925,600	270,400	13.7	200
591.9	3.26	78.7	.709	55.84	7,017,000	877,200	256,600	13.7	190
553.7	3.23	73.8	.718	52.99	6,656,000	832,000	243,000	13.7	180
177.9	2.15	33.7	1.140	38.47	4,544,000	568,000	218,200	10.4	131
158.4	2.10	30.1	1.192	35.87	4,172,000	521,500	209,600	10.0	122
145.6	2.07	27.7	1.221	33.85	3,915,000	489,400	199,100	9.8	115
132.9	2.04	25.4	1.255	31.85	3,660,000	457,400	183,500	10.0	108
491.1	3.09	68.8	.748	51.45	5,997,000	749,600	239,600	12.5	175
458.3	3.07	64.3	.758	48.75	5,678,000	709,800	226,800	12.5	166
425.4	3.04	59.9	.767	45.93	5,353,000	669,100	212,400	12.6	156
389.8	3.02	55.1	.775	42.69	4,992,000	624,000	194,800	12.8	145
141.2	2.07	28.1	1.174	32.95	3,677,000	459,600	181,400	10.1	112
128.7	2.05	25.7	1.195	30.66	3,417,000	427,100	164,200	10.4	104
117.4	2.03	23.5	1.218	28.61	3,181,000	397,700	146,900	10.8	97
106.7	1.99	21.4	1.256	26.86	2,962,000	370,300	135,400	10.9	91
91.0	1.91	18.2	1.369	24.96	2,665,000	333,200	134,500	9.9	85
492.6	3.13	69.9	.719	50.30	5,593,000	699,200	216,800	12.9	171
442.7	3.10	63.1	.732	46.19	5,135,000	641,800	198,000	13.0	157
395.7	3.05	56.5	.754	42.61	4,706,000	588,200	185,600	12.7	145
115.7	1.97	24.2	1.227	29.69	3,088,000	386,100	162,600	9.5	101
100.4	1.93	21.1	1.272	26.83	2,769,000	346,200	147,100	9.4	91
91.0	1.91	19.2	1.307	25.04	2,569,000	321,200	133,500	9.6	85



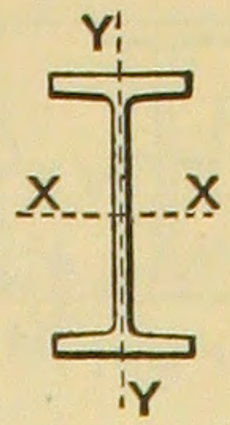
PROPERTIES OF

BETHLEHEM SECTIONS

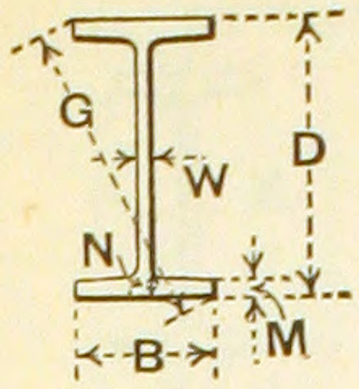
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches	Width of Flange, Inches	THICKNESS IN INCHES			Diagonal Distance, Inches	AXIS X-X			
				Web	Flange			Moment of Inertia, Inches⁴	Radius of Gyration, Inches	Section Modulus, Inches³	Bending Factor
		D	B	W	M	N	G	I	r	S	k
G24a 24×14	160	24.72	14.090	.660	.851	1.411	28 7/16	5092.6	10.40	412.0	.114
	150	24.56	14.065	.635	.771	1.331	28 5/16	4719.6	10.34	384.3	.115
	140	24.41	14.030	.600	.696	1.256	28 1/8	4360.9	10.29	357.3	.115
	130	24.25	14.000	.570	.616	1.176	28	3993.1	10.22	329.3	.116
G24 24×12	120	24.31	12.090	.560	.690	1.170	27 1/8	3632.9	10.14	298.9	.118
	110	24.16	12.040	.510	.615	1.095	27	3307.8	10.11	273.8	.118
	100	24.00	12.000	.470	.535	1.015	26 13/16	2982.5	10.06	248.5	.118
B24a 24×10	93	24.26	10.040	.485	.606	1.004	26 1/4	2716.7	9.96	224.0	.122
	85	24.12	10.000	.445	.536	.934	26 1/8	2464.3	9.93	204.3	.122
B24 24×9	81	24.12	9.040	.455	.561	.919	25 3/4	2288.4	9.79	189.8	.126
	74	24.00	9.000	.415	.501	.859	25 5/8	2085.3	9.78	173.8	.126
	70	23.88	8.995	.410	.441	.799	25 1/2	1924.9	9.66	161.2	.128
G22 22×13	116	22.12	13.035	.535	.620	1.140	25 11/16	2988.1	9.36	270.2	.126
	108	22.00	13.000	.500	.560	1.080	25 9/16	2766.7	9.33	251.5	.126
	101	21.88	12.975	.475	.500	1.020	25 7/16	2557.2	9.28	233.7	.127
B22a 22×9¼	96	22.25	9.315	.545	.722	1.088	24 1/8	2328.5	9.08	209.3	.135
	89	22.12	9.280	.510	.657	1.023	24	2147.9	9.05	194.2	.135
	83	22.00	9.250	.480	.597	.963	23 7/8	1985.8	9.01	180.5	.135
	77	21.89	9.215	.445	.542	.908	23 3/4	1832.7	8.99	167.4	.135
B22 22×8½	73	22.38	8.555	.435	.546	.884	23 15/16	1786.1	9.11	159.6	.135
	67	22.25	8.525	.405	.481	.819	23 13/16	1620.2	9.06	145.6	.136
	62	22.12	8.505	.385	.416	.754	23 11/16	1465.7	8.98	132.5	.137
	58	22.00	8.500	.380	.356	.694	23 9/16	1337.1	8.85	121.6	.140

PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
465.9	3.15	66.1	.711	47.04	4,944,000	618,000	195,800	12.6	160
426.1	3.11	60.6	.729	44.17	4,612,000	576,500	187,100	12.3	150
388.2	3.07	55.3	.745	41.21	4,288,000	536,000	175,800	12.2	140
348.9	3.02	49.8	.767	38.23	3,952,000	494,000	165,900	11.9	130
240.6	2.61	39.8	.888	35.36	3,587,000	448,300	163,400	11.0	120
215.6	2.58	35.8	.903	32.34	3,286,000	410,700	147,900	11.1	110
190.3	2.54	31.7	.929	29.45	2,982,000	372,800	135,400	11.0	100
120.1	2.09	23.9	1.144	27.36	2,688,000	336,000	141,200	9.5	93
106.9	2.07	21.4	1.169	24.99	2,452,000	306,500	128,800	9.5	85
80.9	1.84	17.9	1.333	23.86	2,277,000	284,600	131,700	8.6	81
72.4	1.82	16.1	1.355	21.81	2,085,000	260,700	113,700	9.2	74
65.0	1.78	14.5	1.426	20.61	1,935,000	241,800	110,800	8.7	70
279.1	2.86	42.8	.797	34.13	3,242,000	405,300	142,000	11.4	116
254.7	2.83	39.2	.811	31.80	3,018,000	377,300	132,000	11.4	108
231.3	2.79	35.7	.833	29.69	2,805,000	350,600	124,700	11.2	101
110.7	1.98	23.8	1.187	28.21	2,512,000	314,000	145,500	8.6	96
100.7	1.96	21.7	1.209	26.23	2,330,000	291,300	135,400	8.6	89
91.7	1.94	19.8	1.233	24.45	2,166,000	270,800	126,700	8.5	83
83.4	1.92	18.1	1.252	22.67	2,009,000	251,200	116,900	8.6	77
66.4	1.76	15.5	1.386	21.52	1,915,000	239,400	116,800	8.2	73
59.0	1.73	13.8	1.428	19.74	1,748,000	218,400	106,900	8.2	67
51.8	1.69	12.2	1.493	18.19	1,590,000	198,800	97,440	8.2	62
45.6	1.63	10.7	1.590	17.06	1,459,000	182,300	94,740	7.7	58



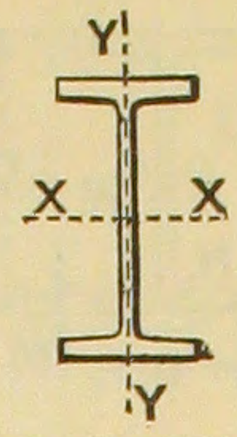
PROPERTIES OF

BETHLEHEM SECTIONS

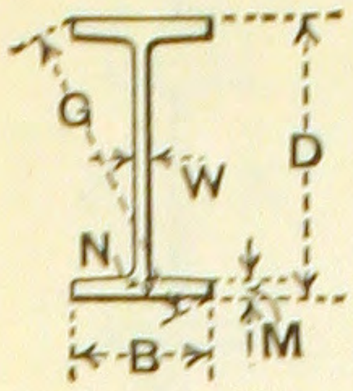
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	Thickness in Inches: Web W	Thickness in Inches: Flange M	Thickness in Inches: Flange N	Diagonal Distance, Inches G	Axis X-X: Moment of Inertia, Inches⁴ I	Axis X-X: Radius of Gyration, Inches r	Axis X-X: Section Modulus, Inches³ S	Axis X-X: Bending Factor k
G20 20×12	146	20.38	12.080	.710	1.003	1.477	23 11/16	3105.1	8.50	304.7	.141
	135	20.18	12.040	.670	.903	1.377	23 1/2	2829.3	8.44	280.4	.142
	125	20.00	12.000	.630	.813	1.287	23 5/16	2584.0	8.38	258.4	.142
	115	19.82	11.960	.590	.723	1.197	23 1/8	2343.9	8.32	236.5	.143
B20a 20×9	98	20.38	9.095	.580	.813	1.167	22 5/16	2010.5	8.34	197.3	.146
	88	20.18	9.035	.520	.713	1.067	22 1/8	1782.4	8.30	176.7	.146
	80	20.00	9.000	.485	.623	.977	21 15/16	1595.0	8.23	159.5	.148
	74	19.88	8.965	.450	.563	.917	21 13/16	1464.7	8.20	147.4	.148
B20 20×8	65	20.25	8.045	.415	.531	.849	21 13/16	1305.6	8.27	128.9	.148
	60	20.12	8.025	.395	.466	.784	21 11/16	1185.5	8.20	117.8	.150
	55	20.00	8.000	.370	.406	.724	21 9/16	1071.9	8.14	107.2	.151
G18 18×11¾	99	18.25	11.795	.485	.649	1.120	21 3/4	1767.7	7.79	193.7	.150
	92	18.12	11.770	.460	.584	1.055	21 5/8	1628.5	7.75	179.8	.151
	86	18.00	11.750	.440	.524	.995	21 1/2	1503.6	7.70	167.1	.152
	80	17.88	11.730	.420	.464	.935	21 3/8	1380.7	7.65	154.4	.153
B18a 18×8¾	77	18.16	8.790	.480	.658	1.004	20 3/16	1287.1	7.53	141.7	.160
	70	18.00	8.750	.440	.578	.924	20	1152.7	7.48	128.1	.161
	64	17.87	8.715	.405	.513	.859	19 7/8	1044.6	7.45	116.9	.161
B18 18×7½	57	18.25	7.560	.380	.530	.830	19 3/4	953.2	7.53	104.5	.161
	52	18.12	7.530	.350	.465	.765	19 5/8	857.1	7.49	94.6	.162
	49	18.06	7.510	.330	.435	.735	19 9/16	810.3	7.48	89.7	.161
	47	18.00	7.500	.320	.405	.705	19 1/2	768.8	7.45	85.4	.162

PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
332.3	2.78	55.0	.781	42.97	3,657,000	457,100	173,600	10.5	146
299.7	2.75	49.8	.798	39.74	3,365,000	420,600	162,200	10.4	135
270.6	2.71	45.1	.815	36.77	3,101,000	387,600	151,200	10.3	125
242.1	2.68	40.5	.836	33.82	2,838,000	354,800	140,300	10.1	115
114.1	1.99	25.1	1.152	28.89	2,368,000	296,000	141,800	8.3	98
99.4	1.96	22.0	1.175	25.86	2,120,000	265,000	125,900	8.4	88
87.2	1.93	19.4	1.214	23.54	1,914,000	239,200	116,400	8.2	80
78.9	1.90	17.6	1.236	21.76	1,768,000	221,000	107,400	8.2	74
53.5	1.67	13.3	1.435	19.08	1,547,000	193,400	100,800	7.7	65
47.5	1.64	11.8	1.491	17.63	1,414,000	176,800	95,370	7.4	60
41.8	1.61	10.5	1.545	16.16	1,286,000	160,800	88,630	7.3	55
211.2	2.69	35.8	.813	29.11	2,325,000	290,600	106,200	10.9	99
192.2	2.66	32.7	.831	27.13	2,157,000	269,600	100,000	10.8	92
174.9	2.63	29.8	.852	25.35	2,005,000	250,600	95,040	10.5	86
157.8	2.59	26.9	.877	23.59	1,853,000	231,700	90,120	10.3	80
85.0	1.93	19.3	1.174	22.70	1,701,000	212,600	104,600	8.1	77
74.8	1.91	17.1	1.203	20.58	1,537,000	192,100	95,040	8.1	70
66.7	1.88	15.3	1.229	18.81	1,403,000	175,400	86,850	8.1	64
44.0	1.62	11.6	1.446	16.81	1,254,000	156,700	83,220	7.5	57
38.8	1.59	10.3	1.485	15.29	1,135,000	141,900	76,100	7.5	52
36.3	1.58	9.67	1.496	14.47	1,077,000	134,600	71,260	7.6	49
34.1	1.57	9.08	1.524	13.84	1,025,000	128,100	67,430	7.6	47



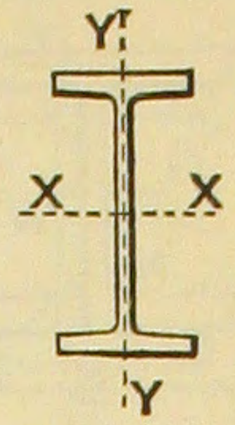
PROPERTIES OF

BETHLEHEM SECTIONS

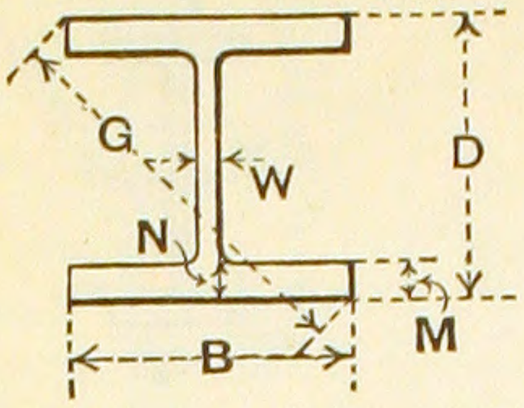
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES Web W	Flange M	Flange N	Diagonal Distance, Inches G	AXIS X-X Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
G16 16×11½	90	16.25	11.580	.490	.594	1.056	19 15/16	1274.1	6.93	156.8	.169
	83	16.12	11.540	.450	.529	.991	19 13/16	1161.6	6.90	144.1	.169
	76	16.00	11.500	.410	.469	.931	19 11/16	1058.6	6.88	132.3	.169
B16a 16×8½	68	16.25	8.550	.435	.616	.954	18 3/8	925.7	6.81	113.9	.175
	63	16.12	8.530	.415	.551	.889	18 1/4	845.9	6.75	105.0	.177
	58	16.00	8.500	.385	.491	.829	18 1/8	769.7	6.72	96.2	.177
B16 16×7¼	50	16.25	7.320	.365	.483	.773	17 13/16	669.0	6.73	82.3	.179
	45	16.12	7.285	.330	.418	.708	17 11/16	594.5	6.69	73.8	.180
	40	16.00	7.250	.295	.358	.648	17 9/16	526.2	6.67	65.8	.180
	37	15.88	7.245	.290	.298	.588	17 7/16	469.2	6.57	59.1	.184
G15 15×11	108	15.32	11.095	.615	.837	1.273	18 15/16	1317.5	6.44	172.0	.185
	99	15.16	11.040	.560	.757	1.193	18 3/4	1198.4	6.41	158.1	.184
	91	15.00	11.000	.520	.677	1.113	18 5/8	1086.8	6.37	144.9	.185
	85	14.88	10.970	.490	.617	1.053	18 1/2	1004.9	6.34	135.1	.185
B15a 15×7½	72	15.31	7.585	.525	.773	1.067	17 1/16	837.2	6.28	109.4	.194
	66	15.16	7.540	.480	.698	.992	16 15/16	758.1	6.25	100.0	.194
	60	15.00	7.500	.440	.618	.912	16 3/4	678.2	6.21	90.4	.194
	55	14.88	7.465	.405	.558	.852	16 5/8	618.4	6.19	83.1	.194
B15 15×6¾	49	15.25	6.835	.385	.521	.789	16 11/16	568.7	6.28	74.6	.194
	44	15.12	6.795	.345	.456	.724	16 9/16	505.9	6.25	66.9	.193
	39	15.00	6.750	.300	.396	.664	16 7/16	447.0	6.25	59.6	.192
	35	14.88	6.730	.280	.336	.604	16 5/16	396.3	6.19	53.3	.194

PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In.	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In.	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′		C	R			
185.1	2.64	32.0	.829	26.51	1,882,000	235,200	95,550	9.8	90
166.4	2.61	28.8	.845	24.36	1,729,000	216,200	87,050	9.9	83
149.3	2.59	26.0	.860	22.34	1,588,000	198,500	78,720	10.1	76
73.6	1.92	17.2	1.162	19.99	1,367,000	170,900	84,830	8.1	68
66.3	1.89	15.5	1.194	18.55	1,259,000	157,400	80,280	7.8	63
59.4	1.87	14.0	1.220	17.05	1,154,000	144,300	73,920	7.8	58
36.6	1.57	10.0	1.477	14.78	988,100	123,500	71,180	6.9	50
31.9	1.55	8.75	1.515	13.26	885,100	110,600	63,840	6.9	45
27.6	1.53	7.61	1.555	11.83	789,200	98,660	56,640	7.0	40
23.7	1.48	6.55	1.662	10.88	709,200	88,650	54,740	6.5	37
217.0	2.61	39.1	.811	31.75	2,064,000	258,000	113,100	9.1	108
195.7	2.59	35.5	.822	29.14	1,897,000	237,200	101,900	9.3	99
175.7	2.56	31.9	.838	26.77	1,739,000	217,400	93,600	9.3	91
161.0	2.54	29.3	.852	25.01	1,621,000	202,600	87,490	9.3	85
62.1	1.71	16.4	1.294	21.20	1,312,000	164,000	96,450	6.8	72
55.6	1.69	14.8	1.314	19.38	1,200,000	150,000	87,320	6.9	66
49.1	1.67	13.1	1.344	17.58	1,085,000	135,600	79,200	6.9	60
44.2	1.65	11.8	1.366	16.16	997,400	124,700	72,320	6.9	55
31.6	1.48	9.24	1.562	14.43	895,000	111,900	70,460	6.4	49
27.6	1.46	8.12	1.594	12.94	803,100	100,400	62,600	6.4	44
23.9	1.45	7.09	1.616	11.45	715,300	89,410	54,000	6.6	39
20.6	1.41	6.13	1.686	10.34	639,300	79,910	50,000	6.4	35



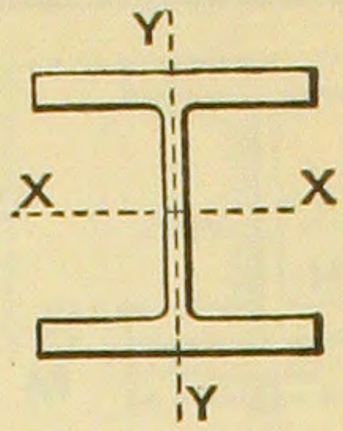
PROPERTIES OF

BETHLEHEM SECTIONS

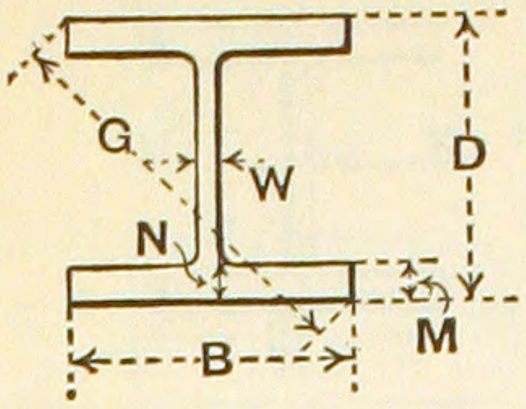
Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	Thickness in Inches: Web W	Thickness in Inches: Flange M	Thickness in Inches: Flange N	Diagonal Distance, Inches G	Axis X-X: Moment of Inertia, Inches⁴ I	Axis X-X: Radius of Gyration, Inches r	Axis X-X: Section Modulus, Inches³ S	Axis X-X: Bending Factor k
H14d 14×16	426	18.69	16.700	1.880	3.033	3.033	25 1/16	6613.0	7.26	707.6	.177
	412	18.50	16.645	1.825	2.938	2.938	24 7/8	6309.7	7.22	682.1	.178
	398	18.31	16.595	1.775	2.843	2.843	24 11/16	6016.3	7.17	657.2	.178
	384	18.12	16.540	1.720	2.748	2.748	24 9/16	5727.5	7.12	632.2	.179
	370	17.94	16.480	1.660	2.658	2.658	24 3/8	5456.6	7.08	608.3	.179
	356	17.75	16.420	1.600	2.563	2.563	24 3/16	5179.4	7.03	583.6	.179
	342	17.56	16.365	1.545	2.468	2.468	24	4911.5	6.99	559.4	.180
	328	17.38	16.300	1.480	2.378	2.378	23 13/16	4658.3	6.95	536.0	.180
	314	17.19	16.240	1.420	2.283	2.283	23 5/8	4401.5	6.90	512.1	.180
	300	17.00	16.180	1.360	2.188	2.188	23 1/2	4151.5	6.86	488.4	.181
	287	16.81	16.130	1.310	2.093	2.093	23 5/16	3912.1	6.81	465.5	.181
	273	16.62	16.070	1.250	1.998	1.998	23 1/8	3675.1	6.76	442.3	.182
	264	16.50	16.025	1.205	1.938	1.938	23	3526.0	6.74	427.4	.182
	255	16.37	15.990	1.170	1.873	1.873	22 7/8	3372.6	6.71	412.0	.182
	246	16.25	15.945	1.125	1.813	1.813	22 3/4	3228.9	6.68	397.4	.182
	237	16.12	15.910	1.090	1.748	1.748	22 5/8	3080.9	6.65	382.2	.182
	228	16.00	15.865	1.045	1.688	1.688	22 9/16	2942.4	6.62	367.8	.182
	219	15.87	15.830	1.010	1.623	1.623	22 7/16	2799.9	6.59	352.8	.183
	211	15.75	15.800	.980	1.563	1.563	22 5/16	2671.4	6.56	339.2	.183
	202	15.63	15.750	.930	1.503	1.503	22 3/16	2538.8	6.54	324.9	.183
	193	15.50	15.710	.890	1.438	1.438	22 1/16	2402.4	6.51	310.0	.183
	184	15.38	15.665	.845	1.378	1.378	21 15/16	2276.4	6.48	296.0	.183
	176	15.25	15.640	.820	1.313	1.313	21 7/8	2149.6	6.45	281.9	.184
	167	15.12	15.600	.780	1.248	1.248	21 3/4	2020.8	6.42	267.3	.184
	158	15.00	15.550	.730	1.188	1.188	21 5/8	1900.6	6.40	253.4	.183
	150	14.88	15.520	.700	1.128	1.128	21 1/2	1788.3	6.36	240.4	.184
	142	14.75	15.500	.680	1.063	1.063	21 3/8	1672.2	6.32	226.7	.185
H14e	320	16.81	16.710	1.890	2.093	2.093	23 11/16	4141.7	6.63	492.8	.191

PROPERTIES OF

BETHLEHEM SECTIONS

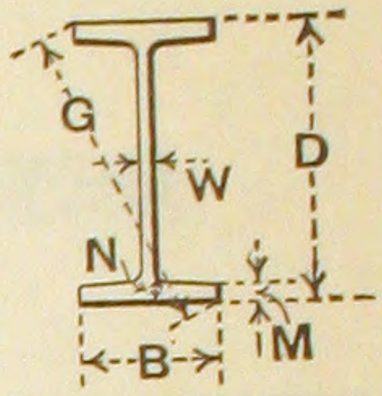


AXIS Y-Y										
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′	Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
2361.7	4.34	282.8	.443	125.34	8,492,000	1,061,000	421,600	10.1	426
2264.9	4.32	272.1	.445	121.15	8,186,000	1,023,000	405,200	10.1	412
2171.7	4.31	261.7	.447	117.08	7,886,000	985,700	390,000	10.1	398
2078.1	4.29	251.3	.449	112.93	7,586,000	948,300	374,000	10.1	384
1987.9	4.27	241.2	.451	108.87	7,300,000	912,500	357,400	10.2	370
1895.7	4.26	230.9	.453	104.68	7,003,000	875,400	340,800	10.3	356
1806.9	4.24	220.8	.456	100.59	6,713,000	839,100	325,600	10.3	342
1720.1	4.22	211.1	.457	96.52	6,433,000	804,100	308,700	10.4	328
1633.0	4.20	201.1	.459	92.39	6,145,000	768,200	292,900	10.5	314
1547.5	4.19	191.3	.462	88.28	5,861,000	732,600	277,400	10.6	300
1466.5	4.17	181.8	.464	84.37	5,585,000	698,200	264,300	10.6	287
1384.2	4.15	172.3	.466	80.30	5,307,000	663,400	249,300	10.6	273
1331.2	4.14	166.1	.467	77.63	5,129,000	641,100	238,600	10.7	264
1278.1	4.13	159.9	.469	74.98	4,945,000	618,100	229,800	10.8	255
1226.6	4.12	153.9	.470	72.33	4,769,000	596,100	219,400	10.9	246
1174.8	4.11	147.7	.472	69.69	4,587,000	573,400	210,800	10.9	237
1124.8	4.10	141.8	.473	67.06	4,414,000	551,700	200,600	11.0	228
1074.2	4.08	135.7	.475	64.44	4,234,000	529,300	192,300	11.0	219
1028.6	4.07	130.2	.477	62.07	4,071,000	508,800	185,200	11.0	211
979.7	4.06	124.4	.477	59.39	3,898,000	487,300	174,400	11.2	202
930.1	4.05	118.4	.479	56.73	3,720,000	465,000	165,500	11.2	193
883.6	4.04	112.8	.480	54.15	3,552,000	444,000	156,000	11.4	184
837.9	4.02	107.1	.483	51.73	3,383,000	422,900	150,100	11.3	176
790.2	4.01	101.3	.485	49.09	3,208,000	401,000	141,500	11.3	167
745.0	4.00	95.8	.485	46.47	3,041,000	380,100	131,400	11.6	158
703.2	3.99	90.6	.487	44.16	2,884,000	360,500	125,000	11.5	150
660.1	3.97	85.2	.491	41.85	2,721,000	340,100	120,400	11.3	142
1635.1	4.17	195.7	.481	94.12	5,913,000	739,200	381,300	7.8	320

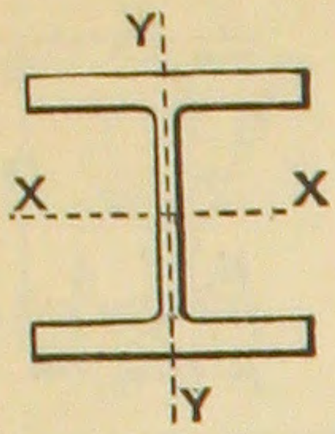


PROPERTIES OF

BETHLEHEM SECTIONS

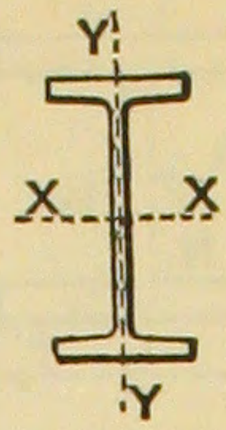


Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES Web W	Flange M	Flange N	Diagonal Distance, Inches G	AXIS X-X Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
	153	15.00	14.830	.750	1.188	1.188	21 1/16	1822.2	6.36	243.0	.185
	145	14.88	14.790	.710	1.128	1.128	21	1711.9	6.34	230.1	.185
	136	14.75	14.740	.660	1.063	1.063	20 7/8	1593.0	6.31	216.0	.185
	127	14.62	14.690	.610	.998	.998	20 3/4	1476.7	6.29	202.0	.185
H14	119	14.50	14.650	.570	.938	.938	20 5/8	1373.1	6.26	189.4	.185
14×14½	111	14.37	14.620	.540	.873	.873	20½	1266.5	6.23	176.3	.185
	103	14.25	14.575	.495	.813	.813	20 3/8	1165.8	6.21	163.6	.185
	95	14.12	14.545	.465	.748	.748	20 1/4	1063.5	6.17	150.6	.185
	87	14.00	14.500	.420	.688	.688	20 1/8	966.9	6.15	138.1	.185
H14a	84	14.18	12.020	.450	.778	.778	18 9/16	928.0	6.13	130.9	.189
14×12	78	14.06	12.000	.430	.718	.718	18½	851.5	6.09	121.1	.190
	74	14.19	10.070	.450	.783	.783	17 3/8	796.7	6.05	112.3	.194
H14b	68	14.06	10.040	.420	.718	.718	17 1/4	724.4	6.01	103.0	.194
14×10	61	13.91	10.000	.380	.643	.643	17 1/8	641.8	5.98	92.3	.195
	58	14.06	8.095	.405	.718	.718	16 1/4	597.5	5.92	85.0	.201
H14c	53	13.94	8.060	.370	.658	.658	16 1/8	542.0	5.90	77.8	.200
14×8	48	13.81	8.030	.340	.593	.593	16	485.0	5.86	70.2	.201
	43	13.68	8.000	.310	.528	.528	15 7/8	429.3	5.82	62.8	.202
	42	14.25	6.820	.335	.443	.713	15 13/16	435.3	5.93	61.1	.203
B14	37	14.12	6.780	.295	.378	.648	15 11/16	381.3	5.91	54.0	.202
14×6¾	33	14.00	6.750	.265	.318	.588	15 9/16	334.3	5.87	47.8	.203
	30	13.88	6.750	.265	.258	.528	15 7/16	294.9	5.76	42.5	.209

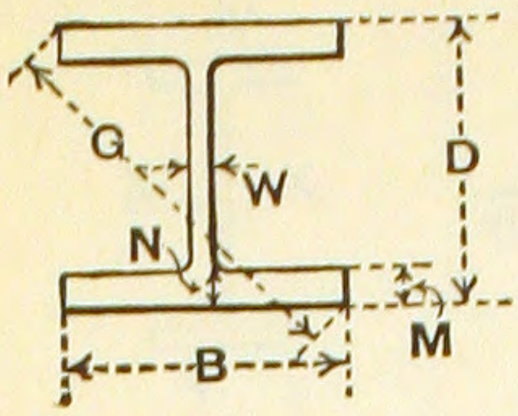


PROPERTIES OF

BETHLEHEM SECTIONS

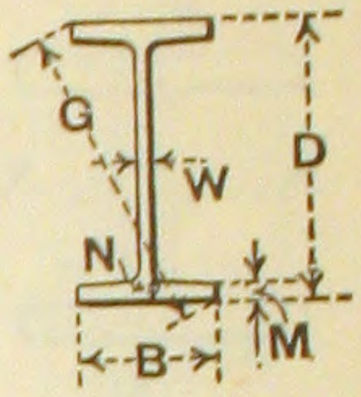


AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
646.3	3.79	87.2	.516	45.01	2,915,000	364,400	135,000	10.8	153
608.7	3.78	82.3	.518	42.64	2,761,000	345,100	126,800	10.9	145
567.7	3.77	77.0	.519	39.98	2,592,000	324,000	116,800	11.1	136
527.6	3.76	71.8	.520	37.33	2,424,000	303,000	107,000	11.3	127
491.8	3.75	67.1	.521	34.99	2,273,000	284,100	99,180	11.5	119
454.9	3.73	62.2	.525	32.65	2,115,000	264,400	93,120	11.4	111
419.7	3.72	57.6	.525	30.26	1,963,000	245,400	84,650	11.6	103
383.8	3.71	52.8	.529	27.94	1,808,000	225,900	78,790	11.5	95
349.7	3.70	48.2	.530	25.56	1,658,000	207,200	70,560	11.7	87
225.3	3.02	37.5	.659	24.69	1,571,000	196,300	76,570	10.3	84
206.9	3.00	34.5	.666	22.97	1,453,000	181,700	72,550	10.0	78
133.4	2.48	26.5	.821	21.76	1,347,000	168,400	76,630	8.8	74
121.2	2.46	24.1	.829	20.03	1,237,000	154,600	70,860	8.7	68
107.3	2.44	21.5	.838	17.97	1,107,000	138,400	63,430	8.7	61
63.6	1.93	15.7	1.085	17.05	1,020,000	127,500	68,330	7.5	58
57.5	1.92	14.3	1.092	15.59	933,200	116,600	61,890	7.5	53
51.2	1.90	12.8	1.107	14.12	842,900	105,400	56,340	7.5	48
45.1	1.89	11.3	1.123	12.67	753,100	94,140	50,890	7.4	43
27.2	1.48	7.98	1.551	12.38	733,200	91,650	57,290	6.4	42
23.3	1.46	6.88	1.588	10.93	648,200	81,020	49,980	6.5	37
19.9	1.43	5.90	1.643	9.70	573,000	71,630	44,520	6.4	33
16.8	1.38	4.99	1.780	8.89	510,000	63,750	44,140	5.8	30

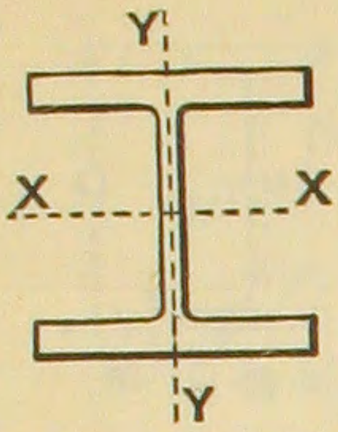


PROPERTIES OF

BETHLEHEM SECTIONS

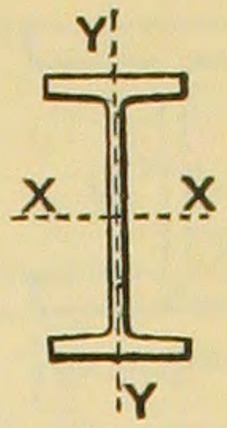


Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	Thickness in Inches: Web W	Thickness in Inches: Flange M	Thickness in Inches: Flange N	Diagonal Distance, Inches G	Axis X-X: Moment of Inertia, Inches⁴ I	Axis X-X: Radius of Gyration, Inches r	Axis X-X: Section Modulus, Inches³ S	Axis X-X: Bending Factor k
	190	14.38	12.670	1.060	1.736	1.736	19 3/16	1892.6	5.82	263.2	.212
	176	14.12	12.615	1.005	1.606	1.606	18 15/16	1712.5	5.75	242.6	.214
	169	14.00	12.575	.965	1.546	1.546	18 13/16	1628.5	5.72	232.6	.214
	161	13.88	12.515	.905	1.486	1.486	18 11/16	1541.8	5.70	222.2	.213
	154	13.75	12.480	.870	1.421	1.421	18 9/16	1456.6	5.67	211.9	.214
	147	13.62	12.450	.840	1.356	1.356	18 7/16	1374.4	5.64	201.8	.214
	140	13.50	12.410	.800	1.296	1.296	18 5/16	1297.5	5.61	192.2	.214
	133	13.38	12.365	.755	1.236	1.236	18 3/16	1221.2	5.59	182.5	.214
H12	126	13.25	12.330	.720	1.171	1.171	18 1/8	1143.2	5.56	172.6	.215
12×12	120	13.12	12.320	.710	1.106	1.106	18	1071.7	5.51	163.4	.216
	113	13.00	12.275	.665	1.046	1.046	17 7/8	1000.4	5.49	153.9	.216
	106	12.88	12.230	.620	.986	.986	17 3/4	930.7	5.46	144.5	.216
	99	12.75	12.190	.580	.921	.921	17 5/8	858.5	5.43	134.7	.216
	92	12.62	12.155	.545	.856	.856	17 1/2	788.9	5.40	125.0	.216
	85	12.50	12.105	.495	.796	.796	17 3/8	723.3	5.38	115.7	.216
	79	12.38	12.080	.470	.736	.736	17 5/16	663.1	5.34	107.1	.217
	72	12.25	12.040	.430	.671	.671	17 3/16	597.4	5.31	97.5	.217
	65	12.12	12.000	.390	.606	.606	17 1/16	533.4	5.28	88.0	.217
	64	12.31	10.065	.405	.701	.701	15 7/8	528.6	5.30	85.9	.219
H12a	58	12.19	10.020	.360	.641	.641	15 3/4	476.5	5.28	78.2	.219
12×10	53	12.06	10.000	.340	.576	.576	15 11/16	425.7	5.23	70.6	.220
	50	12.19	8.075	.370	.641	.641	14 5/8	394.3	5.18	64.7	.227
H12b	45	12.06	8.040	.335	.576	.576	14 1/2	350.6	5.15	58.1	.227
12×8	40	11.94	8.000	.295	.516	.516	14 3/8	310.2	5.13	52.0	.227
	60	12.12	10.020	.390	.461	.863	15 3/4	479.1	5.21	79.1	.223
G12	55	12.00	10.000	.370	.401	.803	15 5/8	432.5	5.17	72.1	.224
12×10											
	36	12.25	6.555	.300	.415	.675	13 7/8	281.8	5.16	46.0	.230
B12	32	12.12	6.530	.275	.350	.610	13 3/4	246.4	5.11	40.7	.232
12×6½	28	12.00	6.500	.245	.290	.550	13 5/8	213.6	5.08	35.6	.233
	25	11.87	6.495	.240	.225	.485	13 1/2	182.8	4.98	30.8	.239
	22	12.31	4.030	.260	.405	.443	12 15/16	155.7	4.91	25.3	.256
BJ12	19	12.16	4.010	.240	.330	.368	12 13/16	130.1	4.81	21.4	.263
12×4	16½	12.00	4.000	.230	.250	.288	12 5/8	105.3	4.65	17.5	.277

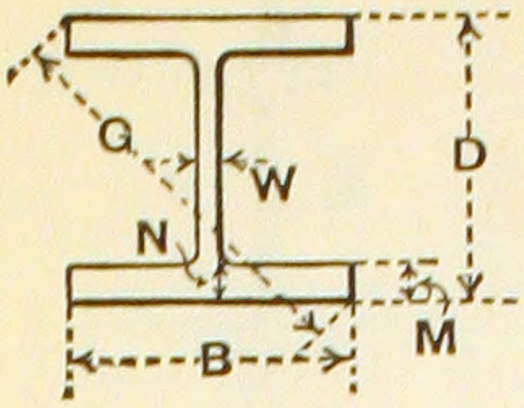


PROPERTIES OF

BETHLEHEM SECTIONS

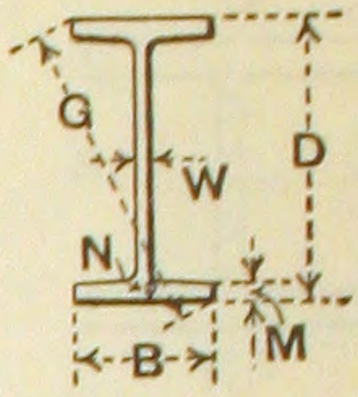


AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
589.7	3.25	93.1	.600	55.86	3,159,000	394,800	182,900	8.6	190
538.4	3.22	85.4	.607	51.79	2,911,000	363,800	170,300	8.5	176
513.3	3.21	81.6	.609	49.72	2,792,000	349,000	162,100	8.6	169
486.2	3.20	77.7	.610	47.38	2,666,000	333,300	150,700	8.8	161
461.0	3.19	73.9	.613	45.27	2,542,000	317,800	143,600	8.9	154
436.8	3.18	70.2	.616	43.24	2,422,000	302,700	137,300	8.8	147
413.4	3.17	66.6	.618	41.20	2,307,000	288,300	129,600	8.9	140
389.9	3.16	63.1	.620	39.11	2,191,000	273,800	121,200	9.0	133
366.3	3.14	59.4	.623	37.04	2,071,000	258,800	114,500	9.0	126
345.1	3.13	56.0	.630	35.31	1,960,000	245,000	111,800	8.8	120
322.8	3.12	52.6	.632	33.24	1,847,000	230,900	103,700	8.9	113
300.9	3.11	49.2	.634	31.19	1,734,000	216,800	95,830	9.0	106
278.3	3.09	45.7	.637	29.09	1,616,000	202,000	88,740	9.1	99
256.4	3.08	42.2	.641	27.06	1,500,000	187,500	82,530	9.1	92
235.5	3.07	38.9	.642	24.98	1,389,000	173,600	74,250	9.4	85
216.4	3.05	35.8	.648	23.22	1,286,000	160,700	69,820	9.2	79
195.3	3.04	32.4	.652	21.16	1,170,000	146,300	63,210	9.3	72
174.6	3.02	29.1	.657	19.11	1,056,000	132,000	56,720	9.3	65
119.2	2.52	23.7	.795	18.84	1,031,000	128,800	59,830	8.6	64
107.5	2.51	21.5	.796	17.08	938,100	117,300	52,660	8.9	58
96.1	2.49	19.2	.809	15.54	847,100	105,900	49,200	8.6	53
56.3	1.96	14.0	1.053	14.70	776,300	97,040	54,120	7.2	50
50.0	1.94	12.4	1.064	13.23	697,700	87,220	48,480	7.2	45
44.1	1.93	11.0	1.069	11.78	623,500	77,940	42,270	7.4	40
94.9	2.32	18.9	.930	17.62	948,800	118,600	56,720	8.4	60
84.3	2.28	16.9	.959	16.18	865,100	108,100	53,280	8.1	55
22.7	1.46	6.93	1.527	10.58	552,000	69,000	44,100	6.3	36
19.4	1.44	5.94	1.585	9.42	488,000	61,000	40,000	6.1	32
16.4	1.41	5.04	1.643	8.28	427,200	53,400	35,280	6.1	28
13.4	1.35	4.12	1.792	7.38	369,600	46,210	34,190	5.4	25
4.55	.84	2.26	2.866	6.47	303,600	37,950	38,410	4.0	22
3.67	.81	1.83	3.071	5.62	256,800	32,100	35,020	3.7	19
2.79	.76	1.39	3.487	4.86	210,500	26,310	33,120	3.2	16½

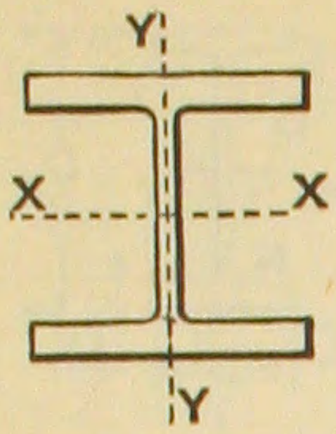


PROPERTIES OF

BETHLEHEM SECTIONS

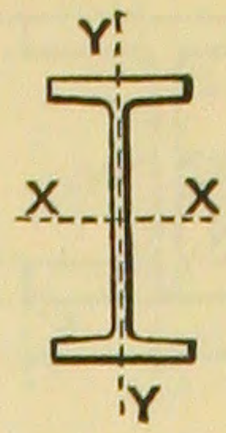


Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES Web W	Flange M	Flange N	Diagonal Distance, Inches G	AXIS X-X Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
	136	11.88	10.575	.915	1.498	1.498	15 7/8	917.2	4.79	154.4	.259
	130	11.75	10.540	.880	1.433	1.433	15 13/16	864.4	4.75	147.1	.260
	124	11.62	10.505	.845	1.368	1.368	15 11/16	813.1	4.72	139.9	.261
	118	11.50	10.460	.800	1.308	1.308	15 9/16	765.3	4.70	133.1	.261
	112	11.38	10.415	.755	1.248	1.248	15 7/16	718.7	4.67	126.3	.261
	106	11.25	10.380	.720	1.183	1.183	15 5/16	671.2	4.64	119.3	.261
	100	11.12	10.345	.685	1.118	1.118	15 3/16	625.0	4.61	112.4	.262
H10	95	11.00	10.320	.660	1.058	1.058	15 1/16	584.2	4.57	106.2	.263
10×10	89	10.88	10.275	.615	.998	.998	14 15/16	542.4	4.55	99.7	.263
	83	10.75	10.235	.575	.933	.933	14 13/16	499.2	4.52	92.9	.263
	77	10.62	10.195	.535	.868	.868	14 3/4	457.2	4.49	86.1	.263
	72	10.50	10.170	.510	.808	.808	14 5/8	420.7	4.46	80.1	.264
	66	10.38	10.120	.460	.748	.748	14 1/2	382.8	4.44	73.7	.264
	60	10.25	10.075	.415	.683	.683	14 3/8	343.7	4.41	67.1	.263
	54	10.12	10.030	.370	.618	.618	14 1/4	305.9	4.39	60.4	.263
	49	10.00	10.000	.340	.558	.558	14 1/8	272.9	4.35	54.6	.264
	45	10.12	8.020	.350	.618	.618	12 15/16	248.5	4.33	49.1	.269
H10a	41	10.00	8.000	.330	.558	.558	12 13/16	222.5	4.29	44.5	.271
10×8	37	9.88	7.975	.305	.498	.498	12 11/16	196.8	4.26	39.8	.273
	33	9.75	7.965	.295	.433	.433	12 9/16	171.1	4.19	35.1	.277
G10	45	10.09	9.010	.330	.384	.746	13 1/2	252.1	4.36	50.0	.265
10×9	42	10.00	9.000	.320	.339	.701	13 7/16	230.9	4.33	46.2	.267
	29	10.25	5.790	.280	.400	.630	11 3/4	160.7	4.32	31.4	.274
B10	26	10.12	5.770	.260	.335	.565	11 5/8	139.5	4.27	27.6	.278
10×5¾	23	10.00	5.750	.240	.275	.505	11 9/16	120.3	4.22	24.1	.281
	21	9.91	5.750	.240	.230	.460	11 7/16	107.5	4.15	21.7	.288
	19	10.25	4.020	.250	.375	.413	11	96.2	4.14	18.8	.299
BJ10	17	10.12	4.010	.240	.310	.348	10 7/8	81.8	4.05	16.2	.308
10×4	15	10.00	4.000	.230	.250	.288	10 3/4	68.8	3.95	13.8	.320

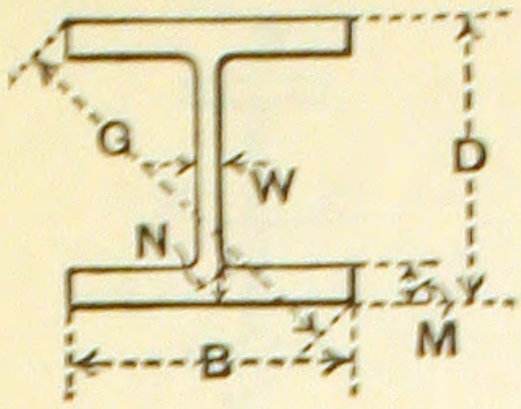


PROPERTIES OF

BETHLEHEM SECTIONS

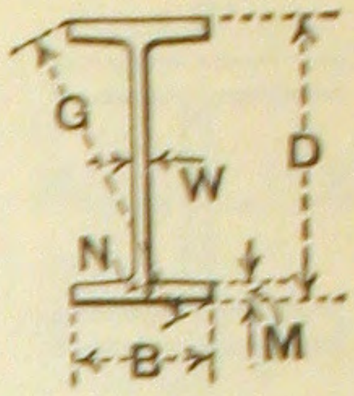


AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In.	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In.	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′		C	R			
295.9	2.72	56.0	.715	40.03	1,853,000	231,600	130,400	7.1	136
280.2	2.71	53.2	.719	38.24	1,766,000	220,700	124,100	7.1	130
264.8	2.69	50.4	.723	36.46	1,679,000	209,900	117,800	7.1	124
249.9	2.68	47.8	.726	34.69	1,597,000	199,600	110,400	7.2	118
235.4	2.67	45.2	.728	32.92	1,516,000	189,500	103,100	7.4	112
220.8	2.66	42.5	.733	31.17	1,432,000	179,000	97,200	7.4	106
206.6	2.65	39.9	.737	29.43	1,349,000	168,600	91,410	7.4	100
194.1	2.64	37.6	.742	27.92	1,275,000	159,300	87,120	7.3	95
180.6	2.63	35.2	.745	26.19	1,196,000	149,500	80,290	7.4	89
166.9	2.61	32.6	.749	24.42	1,114,000	139,300	74,180	7.5	83
153.4	2.60	30.1	.753	22.67	1,033,000	129,100	68,180	7.6	77
141.8	2.59	27.9	.760	21.18	961,500	120,200	64,260	7.5	72
129.3	2.58	25.6	.761	19.44	885,000	110,600	57,300	7.7	66
116.5	2.57	23.1	.764	17.66	804,800	100,600	51,050	7.9	60
104.0	2.56	20.7	.767	15.90	725,400	90,670	44,930	8.1	54
93.0	2.54	18.6	.774	14.40	655,000	81,870	40,800	8.0	49
53.2	2.00	13.3	.998	13.24	589,400	73,680	42,500	6.9	45
47.7	1.99	11.9	1.013	12.07	534,100	66,760	39,600	6.7	41
42.1	1.97	10.6	1.028	10.87	478,100	59,760	36,160	6.6	37
36.5	1.94	9.17	1.062	9.73	421,100	52,630	34,520	6.1	33
58.3	2.10	12.9	1.024	13.25	599,700	74,970	39,960	7.5	45
52.6	2.07	11.7	1.055	12.34	554,100	69,260	38,400	7.2	42
14.9	1.32	5.15	1.671	8.61	376,400	47,050	34,440	5.5	29
12.7	1.29	4.39	1.742	7.65	330,800	41,350	31,570	5.2	26
10.6	1.25	3.70	1.829	6.76	288,700	36,090	28,800	5.0	23
9.20	1.21	3.20	1.950	6.24	260,300	32,540	28,540	4.6	21
4.19	.86	2.08	2.693	5.61	225,300	28,160	30,750	3.7	19
3.45	.83	1.72	2.892	4.98	194,000	24,250	29,150	3.3	17
2.79	.80	1.39	3.159	4.40	165,100	20,630	27,600	3.0	15

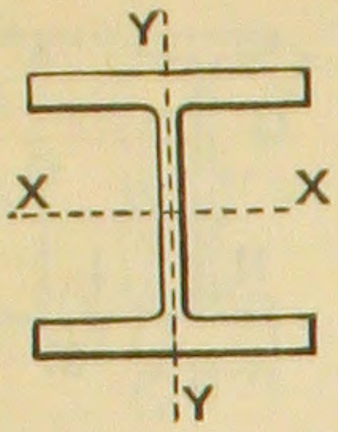


PROPERTIES OF

BETHLEHEM SECTIONS

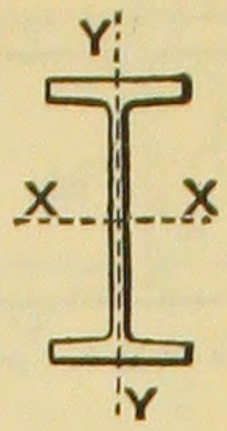


Section Number	Weight per Foot, Pounds	Depth of Beam, Inches D	Width of Flange, Inches B	THICKNESS IN INCHES			Diagonal Distance, Inches G	AXIS X-X			
				Web W	Flange M	Flange N		Moment of Inertia, Inches⁴ I	Radius of Gyration, Inches r	Section Modulus, Inches³ S	Bending Factor k
B9	23	9.12	5.525	.260	.300	.520	10 11/16	99.2	3.83	21.8	.310
9×5½	20	9.00	5.500	.235	.240	.460	10 3/16	84.1	3.79	18.7	.314
	67	9.00	8.285	.575	.933	.933	12¼	271.7	3.71	60.4	.326
	62	8.88	8.230	.520	.873	.873	12⅛	248.6	3.69	56.0	.325
	58	8.75	8.220	.510	.808	.808	12	227.3	3.65	51.9	.328
	53	8.62	8.175	.465	.743	.743	11⅞	204.7	3.62	47.5	.328
H8	48	8.50	8.115	.405	.683	.683	11¾	183.7	3.61	43.2	.327
8×8	44	8.38	8.090	.380	.623	.623	11⅝	165.1	3.57	39.4	.328
	40	8.25	8.075	.365	.558	.558	11 9/16	146.2	3.53	35.5	.332
	35	8.12	8.025	.315	.493	.493	11 7/16	126.4	3.50	31.1	.331
	33	8.06	8.010	.300	.463	.463	11⅜	117.9	3.49	29.3	.331
	31	8.00	8.000	.290	.433	.433	11 5/16	109.7	3.47	27.4	.333
	30	8.12	6.570	.310	.493	.493	10 7/16	105.4	3.46	26.0	.340
H8a	27	8.03	6.535	.275	.448	.448	10⅜	94.2	3.44	23.5	.339
8×6½	24	7.94	6.500	.240	.403	.403	10¼	83.4	3.43	21.0	.337
	21	8.19	5.275	.260	.296	.504	9¾	73.5	3.44	17.9	.346
B8	19	8.09	5.265	.250	.246	.454	9⅝	64.3	3.39	15.9	.352
8×5¼	17	8.00	5.250	.235	.201	.409	9 3/16	56.0	3.35	14.0	.357
BJ8	15	8.12	4.015	.245	.295	.333	9 1/16	48.0	3.29	11.8	.375
8×4	13	8.00	4.000	.230	.235	.273	8 15/16	39.5	3.21	9.88	.387

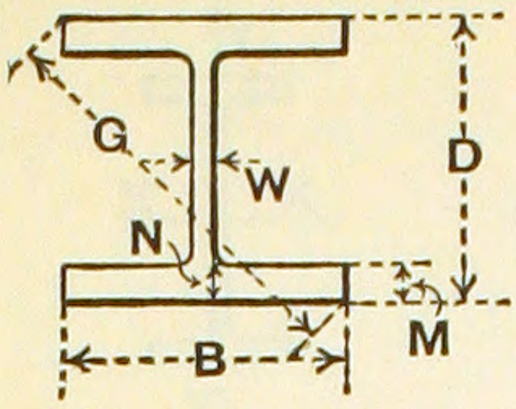


PROPERTIES OF

BETHLEHEM SECTIONS

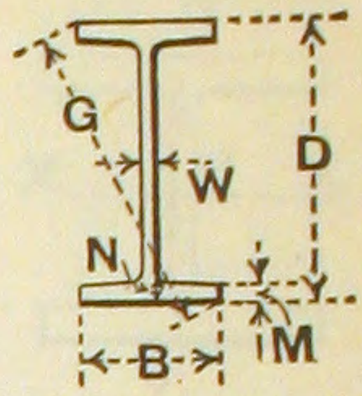


AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
10.1	1.22	3.65	1.852	6.75	261,100	32,630	28,450	4.6	23
8.26	1.19	3.00	1.952	5.86	224,200	28,030	25,380	4.4	20
88.6	2.12	21.4	.921	19.70	724,500	90,570	62,100	5.8	67
81.2	2.11	19.7	.923	18.22	672,000	83,990	55,410	6.1	62
74.9	2.10	18.2	.936	17.06	623,400	77,920	53,550	5.8	58
67.7	2.08	16.6	.942	15.60	570,000	71,250	48,100	5.9	53
60.9	2.08	15.0	.940	14.11	518,600	64,830	41,310	6.3	48
55.0	2.06	13.6	.950	12.93	472,900	59,110	38,210	6.2	44
49.0	2.04	12.1	.968	11.75	425,400	53,180	36,140	5.9	40
42.5	2.03	10.6	.972	10.30	373,700	46,710	30,690	6.1	35
39.7	2.02	9.91	.978	9.69	351,000	43,880	29,020	6.0	33
37.0	2.01	9.24	.988	9.13	329,200	41,140	27,840	5.9	31
23.3	1.63	7.10	1.243	8.83	311,500	38,930	30,210	5.2	30
20.9	1.62	6.38	1.246	7.95	281,600	35,200	26,500	5.3	27
18.5	1.61	5.68	1.248	7.09	252,100	31,510	22,870	5.5	24
8.59	1.18	3.26	1.906	6.20	215,300	26,920	25,550	4.2	21
7.32	1.14	2.78	2.013	5.60	190,800	23,840	24,270	3.9	19
6.16	1.11	2.35	2.130	5.00	168,000	21,000	22,560	3.7	17
3.30	.86	1.65	2.692	4.43	141,900	17,730	23,870	3.0	15
2.62	.83	1.31	2.917	3.83	118,600	14,830	22,080	2.7	13

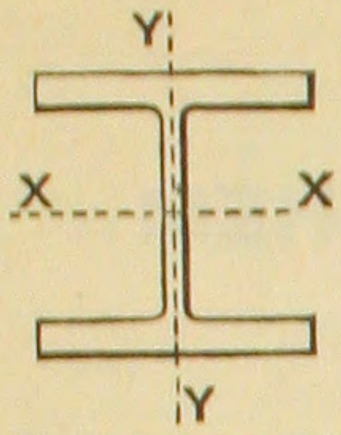


PROPERTIES OF

BETHLEHEM SECTIONS

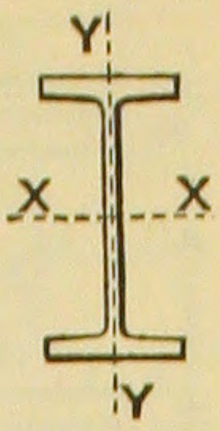


Section Number	Weight per Foot, Pounds	Depth of Beam, Inches	Width of Flange, Inches	THICKNESS IN INCHES			Diagonal Distance, Inches	AXIS X-X			
				Web	Flange			Moment of Inertia, Inches^4	Radius of Gyration, Inches	Section Modulus, Inches^3	Bending Factor
		D	B	W	M	N	G	I	r	S	k
H6a 6×10	88	7.23	10.420	.990	.990	.990	12 11/16	215.0	2.88	59.5	.436
	80	7.06	10.335	.905	.905	.905	12 1/2	189.9	2.84	53.8	.438
	73	6.91	10.260	.830	.830	.830	12 3/8	168.9	2.80	48.9	.439
	67	6.78	10.195	.765	.765	.765	12 1/4	151.6	2.77	44.7	.440
	60	6.63	10.120	.690	.690	.690	12 1/8	132.6	2.74	40.0	.442
	53	6.47	10.040	.610	.610	.610	11 15/16	113.4	2.70	35.1	.443
	46	6.32	9.965	.535	.535	.535	11 13/16	96.4	2.67	30.5	.444
	40	6.18	9.895	.465	.465	.465	11 11/16	81.4	2.64	26.3	.445
H6 6×6	40 1/2	6.75	6.225	.475	.750	.750	9 3/16	90.7	2.76	26.9	.443
	30	6.38	6.100	.350	.565	.565	8 13/16	63.2	2.68	19.8	.445
	26 1/2	6.25	6.065	.315	.500	.500	8 11/16	54.6	2.65	17.5	.447
	23	6.12	6.025	.275	.435	.435	8 9/16	46.3	2.62	15.1	.447
	20	6.00	6.000	.250	.375	.375	8 1/2	39.2	2.58	13.1	.451
BS6 6×6	18	6.09	6.025	.265	.285	.343	8 9/16	35.5	2.59	11.7	.453
	15 1/2	6.00	6.000	.240	.240	.298	8 1/2	30.1	2.56	10.0	.457
BJ6 6×4	16	6.25	4.030	.260	.385	.423	7 7/16	31.7	2.59	10.1	.465
	14	6.12	4.015	.245	.320	.358	7 5/16	26.4	2.54	8.63	.476
	12	6.00	4.000	.230	.260	.298	7 3/16	21.7	2.48	7.24	.488

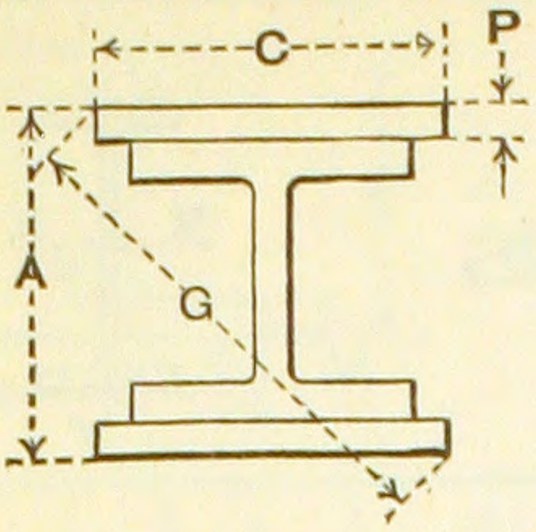


PROPERTIES OF

BETHLEHEM SECTIONS



AXIS Y-Y				Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight per Foot, Pounds
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′						
187.1	2.69	35.9	.721	25.91	713,600	89,200	85,890	4.2	88
166.9	2.66	32.3	.729	23.53	645,400	80,680	76,670	4.2	80
149.7	2.64	29.2	.736	21.47	586,600	73,320	68,820	4.3	73
135.3	2.62	26.5	.742	19.69	536,600	67,070	62,240	4.3	67
119.3	2.60	23.6	.749	17.67	479,900	59,990	54,900	4.4	60
103.0	2.58	20.5	.757	15.53	420,600	52,580	47,360	4.4	53
88.3	2.55	17.7	.764	13.55	366,200	45,770	40,570	4.5	46
75.1	2.53	15.2	.772	11.72	316,200	39,520	34,480	4.6	40
30.2	1.59	9.71	1.227	11.91	322,500	40,310	38,480	4.2	40½
21.4	1.56	7.02	1.255	8.81	237,700	29,710	26,800	4.4	30
18.6	1.54	6.14	1.270	7.80	209,500	26,190	23,630	4.4	26½
15.9	1.53	5.27	1.284	6.76	181,400	22,670	20,200	4.5	23
13.5	1.51	4.50	1.308	5.89	156,700	19,580	18,000	4.4	20
11.0	1.44	3.64	1.453	5.28	140,100	17,510	19,370	3.6	18
9.19	1.42	3.06	1.498	4.59	120,500	15,070	17,280	3.5	15½
4.32	.96	2.14	2.202	4.72	121,800	15,220	19,500	3.1	16
3.57	.93	1.78	2.309	4.11	103,600	12,950	17,990	2.9	14
2.89	.90	1.44	2.448	3.53	86,880	10,860	16,560	2.6	12



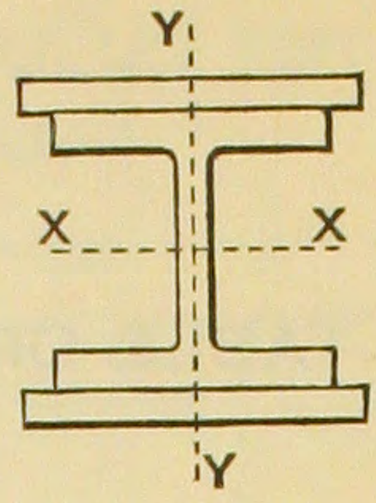
PROPERTIES OF

REINFORCED BETHLEHEM H COLUMNS

Section Reinforced	COVER PLATES		Weight of Column per Foot, Pounds	Total Depth, Inches	Diagonal Distance, Inches	AXIS X-X			
	Width, Inches C	Thickness, Inches P		A	G	Moment of Inertia, Inches^4 I	Radius of Gyration, Inches r	Section Modulus, Inches^3 S	Bending Factor k
	22	3 1/4	912	25.19	33 7/16	23,948	9.45	1,901.4	.141
	22	3 1/8	894	24.94	33 1/4	23,084	9.37	1,851.1	.142
	22	3	875	24.69	33 1/16	22,237	9.30	1,801.3	.143
	22	2 7/8	856	24.44	32 7/8	21,407	9.22	1,751.8	.144
	22	2 3/4	838	24.19	32 11/16	20,594	9.14	1,702.7	.145
	22	2 5/8	819	23.94	32 1/2	19,798	9.07	1,654.0	.146
	22	2 1/2	800	23.69	32 5/16	19,018	8.99	1,605.6	.147
	21	2 1/2	783	23.69	31 11/16	18,454	8.95	1,558.0	.148
	21	2 3/8	765	23.44	31 1/2	17,725	8.87	1,512.4	.149
	21	2 1/4	747	23.19	31 5/16	17,012	8.80	1,467.2	.150
	21	2 1/8	730	22.94	31 1/8	16,314	8.72	1,422.3	.151
H14d×426	21	2	712	22.69	30 15/16	15,631	8.64	1,377.8	.152
	20	2	698	22.69	30 1/4	15,201	8.60	1,339.9	.153
	20	1 7/8	681	22.44	30 1/16	14,565	8.53	1,298.1	.154
	20	1 3/4	664	22.19	29 7/8	13,942	8.45	1,256.6	.155
	20	1 5/8	647	21.94	29 11/16	13,334	8.37	1,215.5	.157
	20	1 1/2	630	21.69	29 1/2	12,739	8.29	1,174.6	.158
	18	1 1/2	610	21.69	28 3/16	12,126	8.22	1,118.1	.160
	18	1 3/8	594	21.44	28	11,603	8.15	1,082.4	.162
	18	1 1/4	579	21.19	27 13/16	11,092	8.07	1,046.9	.163
	18	1 1/8	564	20.94	27 5/8	10,593	7.99	1,011.7	.164
	18	1	549	20.69	27 7/16	10,105	7.91	976.8	.165
	18	1 3/4	534	20.31	27 1/8	9583.2	7.81	943.7	.166
	18	1 5/8	519	20.06	26 15/16	9124.9	7.73	909.8	.168
	18	1 1/2	504	19.81	26 3/4	8677.8	7.65	876.1	.169
H14e×320	18	1 3/8	488	19.56	26 9/16	8241.8	7.58	842.7	.170
	18	1 1/4	473	19.31	26 3/8	7816.9	7.50	809.6	.172
	18	1 1/8	458	19.06	26 3/16	7402.8	7.42	776.8	.173
	18	1	442	18.81	26 1/16	6999.5	7.33	744.2	.175

PROPERTIES OF

REINFORCED BETHLEHEM H COLUMNS



AXIS Y-Y									
Moment of Inertia, Inches^4 I′	Radius of Gyration, Inches r′	Section Modulus, Inches^3 S′	Bending Factor k′	Area of Section, Square Inches	Coefficient of Strength in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. C	Moment of Resistance in Foot Pounds for Fiber Stress of 18,000 Lbs. per Sq. In. R	Maximum Safe Shear on Web, Pounds	Minimum Span, Feet	Weight of Column per Foot, Pounds
8129.4	5.50	739.0	.363	268.34	22,820,000	2,852,000	421,600	27.1	912
7907.5	5.48	718.9	.366	262.84	22,210,000	2,777,000	421,600	26.3	894
7685.7	5.46	698.7	.368	257.34	21,620,000	2,702,000	421,600	25.6	875
7463.9	5.44	678.5	.371	251.84	21,020,000	2,628,000	421,600	24.9	856
7242.0	5.42	658.4	.374	246.34	20,430,000	2,554,000	421,600	24.2	838
7020.2	5.40	638.2	.377	240.84	19,850,000	2,481,000	421,600	23.5	819
6798.4	5.37	618.0	.381	235.34	19,270,000	2,408,000	421,600	22.8	800
6220.4	5.20	592.4	.389	230.34	18,700,000	2,337,000	421,600	22.2	783
6027.5	5.17	574.0	.392	225.09	18,150,000	2,269,000	421,600	21.5	765
5834.6	5.15	555.7	.396	219.84	17,610,000	2,201,000	421,600	20.9	747
5641.6	5.13	537.3	.399	214.59	17,070,000	2,133,000	421,600	20.2	730
5448.7	5.10	518.9	.403	209.34	16,530,000	2,067,000	421,600	19.6	712
5028.4	4.95	502.8	.408	205.34	16,080,000	2,010,000	421,600	19.1	698
4861.7	4.93	486.2	.412	200.34	15,580,000	1,947,000	421,600	18.5	681
4695.0	4.90	469.5	.416	195.34	15,080,000	1,885,000	421,600	17.9	664
4528.4	4.88	452.8	.420	190.34	14,590,000	1,823,000	421,600	17.3	647
4361.7	4.85	436.2	.425	185.34	14,100,000	1,762,000	421,600	16.7	630
3819.7	4.61	424.4	.423	179.34	13,420,000	1,677,000	421,600	15.9	610
3698.2	4.60	410.9	.426	174.84	12,990,000	1,624,000	421,600	15.4	594
3576.7	4.58	397.4	.429	170.34	12,560,000	1,570,000	421,600	14.9	579
3455.2	4.56	383.9	.432	165.84	12,140,000	1,518,000	421,600	14.4	564
3333.7	4.55	370.4	.436	161.34	11,720,000	1,465,000	421,600	13.9	549
3336.1	4.61	370.7	.424	157.12	11,320,000	1,416,000	381,300	14.9	534
3214.6	4.59	357.2	.427	152.62	10,920,000	1,365,000	381,300	14.3	519
3093.1	4.57	343.7	.431	148.12	10,510,000	1,314,000	381,300	13.8	504
2971.6	4.55	330.2	.435	143.62	10,110,000	1,264,000	381,300	13.3	488
2850.1	4.53	316.7	.439	139.12	9,715,000	1,214,000	381,300	12.7	473
2728.6	4.50	303.2	.444	134.62	9,322,000	1,165,000	381,300	12.2	458
2607.1	4.48	289.7	.449	130.12	8,931,000	1,116,000	381,300	11.7	442

EXPLANATION OF
TABLE OF ECONOMY WITH RESPECT TO SECTION MODULUS

The following table presents Bethlehem Sections for any given section modulus in the order of the most economical sections for various depths. Section moduli decrease from line to line reading down the page; efficiencies decrease from left to right across the page.

The section modulus given in the first column opposite any particular line of Bethlehem Sections is to be considered the maximum for the beams listed in that line unless some one of those sections is followed by an asterisk (*). In such a case, the section modulus for the section so marked is 0.1 to 0.3 of a unit less than the value in the left hand column. This was done to condense the table. When a desired section modulus lies between two adjacent values shown in the table, use the line of higher section modulus.

Only the most economical section of equal or higher section modulus is shown for any given depth. No depth is represented whose most economical section is surpassed in economy by a beam of less depth. In general the sections given under the heading "First Selection" are the most economical. There are, however, cases in which deeper beams of equal economy are available. If a "First Selection" beam is too deep for framing, proceed towards the right in the same line until a section of suitable depth is reached. It will be the most economical Bethlehem Section for the given conditions of required strength and allowable depth.

The following example illustrates the use of the table:

Required: a beam with a section modulus of 150 which will not exceed 17 inches in depth.

From the tables we note that opposite the next higher section modulus, namely 150.6, that B24 x 70 is the most economical section but its depth is too great. Since the depth must be less than 17 inches, we find that under column "Fourth Selection" section G16 x 90 is the proper one to use. Referring to page 12 we note that the actual depth is 16.25 inches and the section modulus 156.8 inches.[3]

All beams are to be secured against yielding sideways.

ECONOMY WITH RESPECT TO SECTION MODULUS FOR BETHLEHEM SECTIONS USED AS BEAMS

Section Modulus, Inches³	BETHLEHEM SECTIONS					
	First Selection	Second Selection	Third Selection	Fourth Selection	Fifth Selection	Sixth Selection
1103.6	G36 x 300					
1030.8	G36 x 280					
949.5	G36 x 260					
911.2	G36 x 250					
881.3	G36 x 250	G33 x 260				
872.0	G36 x 240	G33 x 260				
833.9	G36 x 230	G33 x 260				
810.5	G36 x 230	G33 x 240				
742.3	G36 x 230	G30 x 240				
740.0	G33 x 220	G30 x 240				
703.2	G33 x 210	G30 x 240				
679.8	G33 x 210	G30 x 220				
669.0	G33 x 200	G30 x 220				
662.0	B36 x 192	G33 x 200	G30 x 220			
617.0	B36 x 192	G30 x 200				
601.5	B36 x 176	G30 x 200				
584.8	B36 x 176	G30 x 190				
568.7	B36 x 167	G30 x 190				
554.7	B36 x 167	G30 x 180				
537.0	B36 x 158	G30 x 180				
507.5	B36 x 150	G30 x 180				
499.7	B36 x 150	G28 x 175				
485.7	B36 x 150	B33 x 152	G28 x 175			
473.2	B36 x 150	B33 x 152	G28 x 166			
466.1	B36 x 150	B33 x 152	G28 x 166	G26 x 171		
446.2	B33 x 141	G28 x 156*	G26 x 171			
427.9	B33 x 141	G28 x 156	G26 x 157			
416.0	B33 x 141	G28 x 145	G26 x 157			
413.0	B33 x 132	G28 x 145	G26 x 157			
412.0	B33 x 132	G28 x 145	G26 x 157	G24a x 160		
392.2	B33 x 132	G26 x 145	G24a x 160			
384.4	B33 x 125	G26 x 145	G24a x 150*			
378.7	B33 x 125	B30 x 131	G26 x 145	G24a x 150		
357.3	B33 x 125	B30 x 131	G24a x 140			
347.7	B30 x 122	G24a x 140				
329.3	B30 x 122	G24a x 130				

ECONOMY WITH RESPECT TO SECTION MODULUS FOR BETHLEHEM SECTIONS USED AS BEAMS

Section Modulus, Inches³	BETHLEHEM SECTIONS					
	First Selection	Second Selection	Third Selection	Fourth Selection	Fifth Selection	Sixth Selection
326.3	B30 x 115	G24a x 130				
306.4	B28 x 112	G24a x 130				
305.0	B30 x 108	B28 x 112	G24a x 130	G20 x 146*		
298.9	B30 x 108	B28 x 112	G24 x 120	G20 x 146		
284.7	B28 x 104	G24 x 120	G20 x 146			
280.4	B28 x 104	G24 x 120	G20 x 135			
273.8	B28 x 104	G24 x 110	G20 x 135			
270.2	B28 x 104	G24 x 110	G22 x 116	G20 x 135		
265.1	B28 x 97	G24 x 110	G22 x 116	G20 x 135		
258.4	B28 x 97	G24 x 110	G22 x 116	G20 x 125		
257.4	B28 x 97	B26 x 101	G24 x 110	G22 x 116	G20 x 125	
251.5	B28 x 97	B26 x 101	G22 x 108	G20 x 125		
248.5	B28 x 97	G24 x 100	G22 x 108	G20 x 125		
246.9	B28 x 91	G24 x 100	G22 x 108	G20 x 125		
243.0	B28 x 91	G24 x 100	G22 x 108	G20 x 125	H14 x 153	
236.5	B28 x 91	G24 x 100	G22 x 108	G20 x 115	H14 x 153	
233.7	B28 x 91	G24 x 100	G22 x 101	G20 x 115	H14 x 153	
230.8	B26 x 91	G24 x 100	G22 x 101	G20 x 115	H14 x 153	
230.1	B26 x 91	G24 x 100	G22 x 101	G20 x 115	H14 x 145	
224.0	B26 x 91	B24a x 93	G22 x 101	G20 x 115	H14 x 145	
222.1	B28 x 85	B26 x 91	B24a x 93	G22 x 101	G20 x 115	H14 x 145
216.0	B28 x 85	B26 x 91	B24a x 93	G22 x 101	G20 x 115	H14 x 136
214.1	B26 x 85	B24a x 93	G22 x 101	G20 x 115	H14 x 136	
209.3	B26 x 85	B24a x 93	B22a x 96	G20 x 115	H14 x 136	
204.3	B24a x 85	B22a x 96	G20 x 115	H14 x 136		
202.0	B24a x 85	B22a x 96	G20 x 115	H14 x 127		
197.3	B24a x 85	B22a x 96	B20a x 98	H14 x 127		
194.2	B24a x 85	B22a x 89	B20a x 98	H14 x 127		
193.7	B24a x 85	B22a x 89	B20a x 98	G18 x 99	H14 x 127	
189.8	B24 x 81	B22a x 89	B20a x 98	G18 x 99	H14 x 127	
189.4	B24 x 81	B22a x 89	B20a x 98	G18 x 99	H14 x 119	
180.5	B24 x 81	B22a x 83	B20a x 98	G18 x 99	H14 x 119	
179.8	B24 x 81	B22a x 83	G18 x 92	H14 x 119		
176.7	B24 x 81	B22a x 83	B20a x 88	G18 x 92	H14 x 119	
176.3	B24 x 81	B22a x 83	B20a x 88	G18 x 92	H14 x 111	
173.8	B24 x 74	B22a x 83	B20a x 88	G18 x 92	H14 x 111	

ECONOMY WITH RESPECT TO SECTION MODULUS FOR BETHLEHEM SECTIONS USED AS BEAMS

Section Modulus, Inches³	BETHLEHEM SECTIONS					
	First Selection	Second Selection	Third Selection	Fourth Selection	Fifth Selection	Sixth Selection
172.0	B24 x 74	B22a x 83	B20a x 88	G18 x 92	G15 x 108	H14 x 111
167.4	B24 x 74	B22a x 77	G18 x 86*	G15 x 108	H14 x 111	
163.6	B24 x 74	B22a x 77	G18 x 86	H14 x 103		
161.2	B24 x 70	B22a x 77	G18 x 86	H14 x 103		
159.6	B24 x 70	B22 x 73	B20a x 80*	G18 x 86	H14 x 103	
158.1	B24 x 70	B22 x 73	B20a x 80	G18 x 86	G15 x 99	H14 x 103
156.8	B24 x 70	B22 x 73	B20a x 80	G18 x 86	G16 x 90	G15 x 99
154.4	B24 x 70	B22 x 73	G18 x 80	G16 x 90	G15 x 99	H14 x 103
150.6	B24 x 70	B22 x 73	G18 x 80	G16 x 90	H14 x 95	
147.4	B24 x 70	B22 x 73	B20a x 74	G18 x 80	G16 x 90	H14 x 95
145.6	B22 x 67	B20a x 74	G18 x 80	G16 x 90	H14 x 95	
144.9	B22 x 67	B20a x 74	G18 x 80	G16 x 90	G15 x 91	H14 x 95
144.1	B22 x 67	B20a x 74	G18 x 80	G16 x 83	G15 x 91	H14 x 95
141.7	B22 x 67	B20a x 74	B18a x 77	G16 x 83	G15 x 91	H14 x 95
138.1	B22 x 67	B20a x 74	B18a x 77	G16 x 83	H14 x 87	
135.1	B22 x 67	B20a x 74	B18a x 77	G16 x 83	G15 x 85	H14 x 87
132.5	B22 x 62	B20a x 74	G16 x 76*	G15 x 85	H14 x 87	H12 x 99
130.9	B22 x 62	B20a x 74	G16 x 76	H14a x 84	H12 x 99	
128.9	B22 x 62	B20 x 65	G16 x 76	H14a x 84	H12 x 99	
128.1	B22 x 62	B20 x 65	B18a x 70	G16 x 76	H14a x 84	H12 x 99
125.0	B22 x 62	B20 x 65	B18a x 70	G16 x 76	H14a x 84	H12 x 92
121.6	B22 x 58	B20 x 65	B18a x 70	G16 x 76	H14a x 84	H12 x 92
121.1	B22 x 58	B20 x 65	B18a x 70	G16 x 76	H14a x 78	H12 x 92
117.8	B22 x 58	B20 x 60	B18a x 70	G16 x 76	H14a x 78	H12 x 92
116.9	B22 x 58	B20 x 60	B18a x 64	G16 x 76	H14a x 78	H12 x 92
115.7	B22 x 58	B20 x 60	B18a x 64	G16 x 76	H14a x 78	H12 x 85
113.9	B22 x 58	B20 x 60	B18a x 64	B16a x 68	H14a x 78	H12 x 85
112.3	B22 x 58	B20 x 60	B18a x 64	B16a x 68	H14b x 74	H12 x 85
109.4	B22 x 58	B20 x 60	B18a x 64	B16a x 68	B15a x 72	H14b x 74
107.2	B20 x 55	B18a x 64	B16a x 68	B15a x 72	H14b x 74	H12 x 79*
105.0	B20 x 55	B16a x 63	B15a x 72	H14b x 74	H12 x 79	
104.5	B20 x 55	B18 x 57	B16a x 63	B15a x 72	H14b x 74	H12 x 79
103.0	B20 x 55	B18 x 57	B16a x 63	H14b x 68	H12 x 79	
100.0	B20 x 55	B18 x 57	B16a x 63	B15a x 66	H14b x 68	H12 x 79
97.5	B20 x 55	B18 x 57	B16a x 63	B15a x 66	H14b x 68	H12 x 72
96.2	B20 x 55	B18 x 57	B16a x 58	B15a x 66	H14b x 68	H12 x 72

ECONOMY WITH RESPECT TO SECTION MODULUS FOR BETHLEHEM SECTIONS USED AS BEAMS

Section Modulus, Inches³	BETHLEHEM SECTIONS					
	First Selection	Second Selection	Third Selection	Fourth Selection	Fifth Selection	Sixth Selection
94.6	B18 x 52	B16a x 58	B15a x 66	H14b x 68	H12 x 72	H10 x 89
92.9	B18 x 52	B16a x 58	B15a x 66	H14b x 68	H12 x 72	H10 x 83
92.3	B18 x 52	B16a x 58	H14b x 61	H12 x 72	H10 x 83	
90.4	B18 x 52	B16a x 58	B15a x 60	H14b x 61	H12 x 72	H10 x 83
89.7	B18 x 49	B16a x 58	B15a x 60	H14b x 61	H12 x 72	H10 x 83
88.0	B18 x 49	B16a x 58	B15a x 60	H14b x 61	H12 x 65	H10 x 83
86.1	B18 x 49	B16a x 58	B15a x 60	H14b x 61	H12a x 64*	H10 x 77
85.4	B18 x 47	B16a x 58	B15a x 60	H14b x 61	H12a x 64	H10 x 77
85.0	B18 x 47	H14c x 58	H12a x 64	H10 x 77		
83.1	B18 x 47	B15a x 55	H14c x 58	H12a x 64	H10 x 77	
82.3	B18 x 47	B16 x 50	B15a x 55	H14c x 58	H12a x 64	H10 x 77
79.1	B18 x 47	B16 x 50	B15a x 55	H14c x 58	G12 x 60	H10 x 72
78.2	B18 x 47	B16 x 50	B15a x 55	H12a x 58	H10 x 72	
77.8	B18 x 47	B16 x 50	H14c x 53	H12a x 58	H10 x 72	
74.6	B18 x 47	B15 x 49	H14c x 53	H12a x 58	H10 x 72	
73.8	B16 x 45	B15 x 49	H14c x 53	H12a x 58	H10 x 66*	
72.1	B16 x 45	B15 x 49	H14c x 53	G12 x 55	H10 x 66	
70.6	B16 x 45	B15 x 49	H12a x 53	H10 x 66		
70.2	B16 x 45	H14c x 48	H12a x 53	H10 x 66		
67.1	B15 x 44*	H14c x 48	H12a x 53	H10 x 60		
65.8	B16 x 40	B15 x 44	H14c x 48	H12a x 53	H10 x 60	
64.7	B16 x 40	B15 x 44	H14c x 48	H12b x 50	H10 x 60	
62.8	B16 x 40	H14c x 43	H12b x 50	H10 x 60		
61.1	B16 x 40	B14 x 42	H12b x 50	H10 x 60		
60.4	B16 x 40	B14 x 42	H12b x 50	H10 x 54	H8 x 67	
59.6	B15 x 39	B14 x 42	H12b x 50	H10 x 54	H8 x 67	
59.1	B16 x 37	B15 x 39	B14 x 42	H12b x 50	H10 x 54	H8 x 67
58.1	B16 x 37	B15 x 39	B14 x 42	H12b x 45	H10 x 54	H8 x 67
56.0	B16 x 37	B15 x 39	B14 x 42	H12b x 45	H10 x 54	H8 x 62
54.6	B16 x 37	B15 x 39	B14 x 42	H12b x 45	H10 x 49	H8 x 62
54.0	B14 x 37	H12b x 45	H10 x 49	H8 x 62		
53.3	B15 x 35	B14 x 37	H12b x 45	H10 x 49	H8 x 62	
52.0	B15 x 35	B14 x 37	H12b x 40	H10 x 49	H8 x 58*	
50.0	B15 x 35	B14 x 37	H12b x 40	G10 x 45	H8 x 58	
47.8	B14 x 33	H12b x 40	G10 x 45	H8 x 53*		
46.2	B14 x 33	B12 x 36*	G10 x 42	H8 x 53		

ECONOMY WITH RESPECT TO SECTION MODULUS FOR BETHLEHEM SECTIONS USED AS BEAMS

Section Modulus, Inches³	BETHLEHEM SECTIONS					
	First Selection	Second Selection	Third Selection	Fourth Selection	Fifth Selection	Sixth Selection
44.5	B14 x 33	B12 x 36	H10a x 41	H8 x 53		
43.2	B14 x 33	B12 x 36	H10a x 41	H8 x 48		
42.5	B14 x 30	B12 x 36	H10a x 41	H8 x 48		
40.7	B14 x 30	B12 x 32	H10a x 41	H8 x 48		
39.8	B14 x 30	B12 x 32	H10a x 37	H8 x 48		
39.4	B14 x 30	B12 x 32	H10a x 37	H8 x 44		
35.6	B12 x 28	H10a x 37	H8 x 40*			
35.1	B12 x 28	H10a x 33	H8 x 40			
31.4	B12 x 28	B10 x 29	H8 x 40			
31.1	B12 x 28	B10 x 29	H8 x 35			
30.8	B12 x 25	B10 x 29	H8 x 35			
29.3	B12 x 25	B10 x 29	H8 x 33			
27.6	B12 x 25	B10 x 26	H8 x 31*			
26.9	B12 x 25	B10 x 26	H8 x 31	H6 x 40½		
26.0	B12 x 25	B10 x 26	H8a x 30	H6 x 40½		
25.3	BJ12 x 22	B10 x 26	H8a x 30	H6 x 40½		
24.1	BJ12 x 22	B10 x 23	H8a x 30	H6 x 40½		
23.5	BJ12 x 22	B10 x 23	H8a x 27	H6 x 40½		
21.8	B10 x 21*	B9 x 23	H8a x 27	H6 x 40½		
21.4	BJ12 x 19	B10 x 21	B9 x 23	H8a x 27	H6 x 40½	
21.0	BJ12 x 19	B10 x 21	B9 x 23	H8a x 24	H6 x 40½	
19.8	BJ12 x 19	B10 x 21	B9 x 23	H8a x 24	H6 x 30	
18.8	BJ10 x 19	B9 x 20*	H8a x 24	H6 x 30		
17.9	BJ10 x 19	B9 x 20	B8 x 21	H6 x 30		
17.5	BJ12 x 16½	BJ10 x 19	B9 x 20	B8 x 21	H6 x 26½	
16.2	BJ12 x 16½	BJ10 x 17	B9 x 20	B8 x 21	H6 x 26½	
15.9	BJ12 x 16½	BJ10 x 17	B8 x 19	H6 x 26½		
15.1	BJ12 x 16½	BJ10 x 17	B8 x 19	H6 x 23		
14.0	BJ12 x 16½	B8 x 17	H6 x 23			
13.8	BJ10 x 15	B8 x 17	H6 x 23			
13.1	BJ10 x 15	B8 x 17	H6 x 20			
11.8	BJ8 x 15	H6 x 20				
10.1	BJ8 x 15	BJ6 x 16				
9.9	BJ8 x 13	BJ6 x 16				
8.6	BJ8 x 13	BJ6 x 14				
7.2	BJ6 x 12					

ALLOWABLE UNIT STRESSES FOR COLUMNS

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 1923

Main, and Short Secondary Members: ratios $\frac{l}{r}$ from 0 to 120.

Allowable stress in Pounds per Square Inch:

15,000 for ratios $\frac{l}{r}$ from 0 to 60.

$$\frac{18{,}000}{1+\frac{l^2}{18{,}000\,r^2}} \text{ for ratios } \frac{l}{r} \text{ from 60 to 120.}$$

Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △
60	15,000		**80**	13,279		**100**	11,571	
61	14,916	84	81	13,192	87	101	11,489	82
62	14,832	84	82	13,105	87	102	11,407	82
63	14,748	84	83	13,018	87	103	11,325	82
64	14,663	85	84	12,931	87	104	11,244	81
65	14,578	85	85	12,844	87	105	11,163	81
66	14,493	85	86	12,758	86	106	11,082	81
67	14,407	86	87	12,672	86	107	11,002	80
68	14,321	86	88	12,585	87	108	10,922	80
69	14,235	86	89	12,500	85	109	10,843	79
70	14,148	87	**90**	12,414	86	**110**	10,764	79
71	14,062	86	91	12,328	86	111	10,686	78
72	13,975	87	92	12,243	85	112	10,608	78
73	13,888	87	93	12,158	85	113	10,530	78
74	13,801	87	94	12,073	85	114	10,453	77
75	13,714	87	95	11,989	84	115	10,376	77
76	13,627	87	96	11,905	84	116	10,300	76
77	13,540	87	97	11,821	84	117	10,224	76
78	13,453	87	98	11,737	84	118	10,149	75
79	13,366	87	99	11,654	83	119	10,074	75
80	13,279		**100**	11,571	83	**120**	10,000	74

The tables of Allowable Unit Stresses for Columns give the allowable stress corresponding to each integral value of l/r, together with the difference, $\triangle$, between each pair of such allowable stresses standing adjacent to each other in the table. As the stresses decrease with an increase in l/r, all the differences are negative. To find the allowable stress for any intermediate value of l/r, look up the value of the stress for the integral part of l/r, and the difference, $\triangle$, between this stress and that corresponding to the next higher value of l/r. Corresponding to this difference there will be found in the Interpolation Table the values of .10 $\triangle$ to .90 $\triangle$ corresponding to the .1 increments in l/r. If l/r is given to hundredths, one tenth the increment for ten times the number of hundredths and the increment for the number of tenths may be added together. As this increment is negative, subtract the number so obtained from the stress for the integral part of l/r. The result is the allowable stress for the given l/r. The computed difference should be rounded up to the units place before subtracting.

For example, suppose the allowable stress is desired when $l/r = 107.37$

The allowable stress when $l/r = 107$ is		11,002
The difference, $\triangle = -80$		
The difference for $\triangle$ l/r of .30 is	−24.0	
One tenth the difference for $10 \times .07$ or .70 is	− 5.6	
The resulting difference is	−29.6 or −30	
The allowable stress when $l/r = 107.37$ is		10,972

INTERPOLATION TABLE FOR DIFFERENCES $\triangle$

$\triangle$	INCREMENTS								
	.10 $\triangle$	.20 $\triangle$	.30 $\triangle$	.40 $\triangle$	.50 $\triangle$	.60 $\triangle$	.70 $\triangle$	.80 $\triangle$	.90 $\triangle$
87	8.7	17.4	26.1	34.8	43.5	52.2	60.9	69.6	78.3
86	8.6	17.2	25.8	34.4	43.0	51.6	60.2	68.8	77.4
85	8.5	17.0	25.5	34.0	42.5	51.0	59.5	68.0	76.5
84	8.4	16.8	25.2	33.6	42.0	50.4	58.8	67.2	75.6
83	8.3	16.6	24.9	33.2	41.5	49.8	58.1	66.4	74.7
82	8.2	16.4	24.6	32.8	41.0	49.2	57.4	65.6	73.8
81	8.1	16.2	24.3	32.4	40.5	48.6	56.7	64.8	72.9
80	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0	72.0
79	7.9	15.8	23.7	31.6	39.5	47.4	55.3	63.2	71.1
78	7.8	15.6	23.4	31.2	39.0	46.8	54.6	62.4	70.2
77	7.7	15.4	23.1	30.8	38.5	46.2	53.9	61.6	69.3
76	7.6	15.2	22.8	30.4	38.0	45.6	53.2	60.8	68.4
75	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0	67.5
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6

It should be noted that the calculation could be based on the stress for $l/r = 108$ in the above problem, in which case $\triangle$ $l/r = -.63$, and the increments of stress are all positive, which simplifies calculations somewhat.

ALLOWABLE UNIT STRESSES FOR COLUMNS

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 1923

Secondary Members Only: ratios $\frac{l}{r}$ from 120 to 200.

Allowable unit stress in Pounds per Square Inch:

$$\frac{18{,}000}{1+\frac{l^2}{18{,}000\ r^2}}$$ **for ratios $\frac{l}{r}$ from 120 to 200.**

No column or strut is permitted whose $\frac{l}{r}$ is greater than 200.

Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △	Ratio $\frac{l}{r}$	Allowable Stress, Pounds per Square Inch	Difference △
120	10,000		146	8,241		173	6,760	
		74			61			49
121	9,926		147	8,180		174	6,711	
		73			60			49
122	9,853		148	8,120		175	6,663	
		73			60			48
123	9,780		149	8,060		176	6,616	
		72			60			47
124	9,708		**150**	8,000		177	6,568	
		72			59			48
125	9,636		151	7,941		178	6,521	
		72			59			47
126	9,564		152	7,882		179	6,475	
		71			58			46
127	9,493		153	7,824		**180**	6,429	
		70			57			46
128	9,423		154	7,767		181	6,383	
		70			57			46
129	9,353		155	7,710		182	6,338	
		69			57			45
130	9,284		156	7,653		183	6,293	
		69			56			45
131	9,215		157	7,597		184	6,248	
		69			56			45
132	9,146		158	7,541		185	6,204	
		68			55			44
133	9,078		159	7,486		186	6,160	
		67			55			44
134	9,011		**160**	7,431		187	6,117	
		67			54			43
135	8,944		161	7,377		188	6,074	
		66			54			43
136	8,878		162	7,323		189	6,031	
		66			53			43
137	8,812		163	7,270		**190**	5,989	
		66			53			42
138	8,746		164	7,217		191	5,947	
		65			53			42
139	8,681		165	7,164		192	5,906	
		64			52			41
140	8,617		166	7,112		193	5,864	
		64			51			42
141	8,553		167	7,061		194	5,824	
		63			52			40
142	8,490		168	7,009		195	5,783	
		63			50			41
143	8,427		169	6,959		196	5,743	
		63			51			40
144	8,364		**170**	6,908		197	5,703	
		62			50			40
145	8,302		171	6,858		198	5,664	
		61			49			39
146	8,241		172	6,809		199	5,625	
					49			39
			173	6,760		**200**	5,586	

INTERPOLATION TABLE FOR DIFFERENCES △

△	INCREMENTS								
	.10 △	.20 △	.30 △	.40 △	.50 △	.60 △	.70 △	.80 △	.90 △
74	7.4	14.8	22.2	29.6	37.0	44.4	51.8	59.2	66.6
73	7.3	14.6	21.9	29.2	36.5	43.8	51.1	58.4	65.7
72	7.2	14.4	21.6	28.8	36.0	43.2	50.4	57.6	64.8
71	7.1	14.2	21.3	28.4	35.5	42.6	49.7	56.8	63.9
70	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0	63.0
69	6.9	13.8	20.7	27.6	34.5	41.4	48.3	55.2	62.1
68	6.8	13.6	20 4	27.2	34.0	40.8	47.6	54.4	61.2
67	6.7	13.4	20.1	26.8	33.5	40.2	46.9	53.6	60.3
66	6.6	13.2	19.8	26.4	33.0	39.6	46.2	52.8	59.4
65	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0	58.5
64	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6
63	6.3	12.6	18.9	25.2	31.5	37.8	44.1	50.4	56.7
62	6.2	12.4	18.6	24.8	31.0	37.2	43.4	49.6	55.8
61	6.1	12.2	18.3	24.4	30.5	36.6	42.7	48.8	54.9
60	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0	54.0
59	5.9	11.8	17.7	23.6	29.5	35.4	41.3	47.2	53.1
58	5.8	11.6	17.4	23.2	29.0	34.8	40.6	46.4	52.2
57	5.7	11.4	17.1	22.8	28.5	34.2	39.9	45.6	51.3
56	5.6	11.2	16.8	22.4	28.0	33.6	39.2	44.8	50.4
55	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5
54	5.4	10.8	16.2	21.6	27.0	32.4	37.8	43.2	48.6
53	5.3	10.6	15.9	21.2	26.5	31.8	37.1	42.4	47.7
52	5.2	10.4	15.6	20.8	26.0	31.2	36.4	41.6	46.8
51	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9
50	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
49	4.9	9.8	14.7	19.6	24.5	29.4	34.3	39.2	44.1
48	4.8	9.6	14.4	19.2	24.0	28.8	33.6	38.4	43.2
47	4.7	9.4	14.1	18.8	23.5	28.2	32.9	37.6	42.3
46	4.6	9.2	13.8	18.4	23.0	27.6	32.2	36.8	41.4
45	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0	40.5
44	4.4	8.8	13.2	17.6	22.0	26.4	30.8	35.2	39.6
43	4.3	8.6	12.9	17.2	21.5	25.8	30.1	34.4	38.7
42	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8
41	4.1	8.2	12.3	16.4	20.5	24.6	28.7	32.8	36.9
40	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0	36.0
39	3.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

PARTIAL LIST OF PRODUCTS

AGRICULTURAL STEEL AND SPECIALTIES: Standard and Special Shapes.

AUTOMOBILE STEEL: Special Steel for Automobile Forgings and Machined Parts.

AUXILIARY LOCOMOTIVES.

AXLES, STEEL: For Passenger and Freight Cars, Engine and Tender Trucks; Driving; Motor; Electric and Mine Car.

BARS AND BANDS: Muck Bars, Refined, Double Refined Iron; Bessemer, Open Hearth, and Electric Furnace Steels; Alloy, Special and Carbon Steels; Concrete Reinforcing Bars; Special Sections either Hot Rolled or Cold Drawn.

BILLETS, BLOOMS, SLABS, SKELP AND SHEET BARS.

BLANKS, ROLLED STEEL: For Gears, Pinions and Fly Wheels.

BOILER HEADS: Flanged and Dished.

BOILER TUBES: Lap Welded; Charcoal Iron, and Steel.

BOLTS, NUTS, RIVETS, SPIKES, POLE LINE MATERIAL.

BRIDGES AND FABRICATED BUILDINGS: Designers, Builders, Fabricators and Erectors of all types of Bridges and Steel Structures. Buckle Plates. Bridge Operating Machinery.

CAR BUILDING SHAPES: Beams, Channels, Angles, Bulb Angles, Z Bars, Side and Center Sill Sections; Belt Rail, Door Spreader and Side Stake Sections.

CARS, MINE: Built to any specifications.

CARS, STEEL FREIGHT: Ballast, Gondola, Hopper, Flat, Tank and Steel Box.

CARS, STEEL PASSENGER: Passenger, Baggage, Express, Mail, Dining, Private, Special and Combination Cars.

CAR PARTS: Underframes and Trucks; Forged, Pressed and Fabricated Miscellaneous Car Parts.

CAR WHEELS, ROLLED STEEL.

CASTINGS: Steel, Iron, Brass and Bronze; Stainless Clad; Centrifugal Castings.

COKE AND COKE BY-PRODUCTS.

FENCING: Woven Wire Field and Poultry Fence, Steel Fence Posts.

FERRO-MANGANESE, SPIEGELEISEN.

FLANGED PRODUCTS: Tank Bottoms, Dome Sheets, Manheads, Yokes, Bolts and Saddles.

FORGINGS: Drop, Hammered and Hydraulically Pressed; All sizes and types; Forged Shafts. Corrosion Resisting Steel, Bronze, Monel Metal, and Stainless Steel Forgings.

PARTIAL LIST OF PRODUCTS—CONCLUDED

FROGS AND SWITCHES: Frogs, Switches, Guard Rails, Crossings, Switch Stands, Steam and Street Railway Special Work; Manganese Trackwork of every description; Light Rail Trackwork for Mines and Industrial Plants; Steel Mine and Industrial Ties; Switch Heaters.

GAS ENGINES: Blowing, Producer Gas, and Other Gas Engines.

GEARS AND PINIONS: Cut and Cast.

INGOT MOULDS: All sizes.

MACHINERY: Hydraulic Machinery and Equipment.

NAILS: Wire, All Kinds and Sizes.

NUTS: Hot Pressed and Cold Punched, Blank or Tapped.

OIL BURNING SYSTEMS: Bethlehem (Dahl) Mechanical Systems for Forced and Natural Draft.

OIL REFINERY EQUIPMENT: Hydraulic Filter Presses, Wax Distillate Chilling Machines, Sweating Pans, Wax Testing and Moulding Machines, Experimental Filter Presses, Stills, Condensers, Tanks and Auxiliary Equipment.

PIG IRON: Standard Grades, Special Grades and Mayari.

PILING: Lackawanna Steel Sheet Piling.

PIPES AND TUBES: Lap-welded and Butt-welded Steel Pipe, Casing and Tubing.

PLATES, STEEL: Universal and Sheared; Circular (Heads), in all grades for all purposes; Miscellaneous Pressed Work.

POSTS, STEEL FENCE: Self-fastener and Punched Types; End, Gate, Corner and Line; Angle and Tee Sections. Snow Fence Posts; Studded "Omega" U Posts.

RAILS AND ACCESSORIES, BETHCO RAIL ANCHORS.

RIVETS: Boiler, Structural, Ship, Bridge, Tank, and Tap.

ROLLS: Carbon and Alloy Steel.

SHEET AND TIN MILL PRODUCTS.

SHIPBUILDING SHAPES: Ship Channels and Bulb Angles.

STRUCTURAL STEEL SHAPES: Bethlehem Beams, Joists and Stanchions, Rolled Girder Beams and Rolled Columns; Standard Beams, Channels and Angles; Standard and Special T and Z Bars; Plain and Fabricated; Crane Rails; Rolled Steel Slabs for Column Bases.

TOOL STEEL FOR EVERY PURPOSE: Bethlehem Special High-Speed; Non-shrinkable; Rock and Mine Drill; Special Tool Steels.

TOOLS: Rivet Sets, Punches and Dies, Chisel Blanks, Chisels, Hot and Cold Friction Saws, Steel Stamps, Slitting Shears, Shear Blades, and Special Tools.

TRACKWORK, INDUSTRIAL AND MINE: (See Frogs and Switches.)

TURNTABLES, RAILROAD: Bethlehem Twin-Span Turntables; Balanced and Continuous Turntables.

WIRE AND WIRE PRODUCTS: Wire Rods, Wire Nails, Wire, Smooth and Barbed Fence Wire. Galvanized Solid Wire Clothes Line.

BETHLEHEM STEEL COMPANY

General Offices
BETHLEHEM, PA.

District Offices

Atlanta	Healey Building
Baltimore	Continental Building
Boston	Atlantic National Bank Building
Buffalo	Marine Trust Building
Chicago	People's Gas Building
Cincinnati	Union Trust Building
Cleveland	Terminal Tower
Detroit	New Penobscot Building
Houston	Petroleum Building
New York	Cunard Building
Philadelphia	Widener Building
Pittsburgh	Oliver Building
St. Louis	Arcade Building
Washington, D. C.	Wilkins Building

Pacific Coast Distributor
Pacific Coast Steel Corporation

Honolulu, T. H.	Schuman Building
Los Angeles	Pacific Finance Building
Portland, Ore.	American Bank Building
San Francisco	20th and Illinois Sts.
Seattle	28th Ave. S. W., and W. Andover St.

Export Distributor
Bethlehem Steel Export Corporation
25 Broadway, New York City

Printed in U. S. A.